American Forestry

VOLUME 28 SEPTEMBER, 1922 NUMBER 345

FORESTRY AS A BUSINESS

THE EASTERN NATIONAL FORESTS

AIRPLANE FIRE-FIGHTING IN CANADA

LAND OF THE CHEROKEES

THE BEECHES

HALL OF FAME FOR TREES

PALM CANYON IN CALIFORNIA

PRACTICAL MAHOGANY PLANTING

The American Forestry Association

Washington, D. C.

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Declaration of Principles and Policy of the American Forestry Association

IT IS A VOLUNTARY organization for the inculcation and spread of a forest policy on a scale adequate for our economic needs, and any person is eligible for membership.

IT IS INDEPENDENT, has no official connection with any Federal or State department or policy, and is devoted to a public service conducive to national prosperity.

IT ASSERTS THAT forestry means the propagation and care of forests for the production of timber as a crop; protection of watershed; utilization of non-agricultural soil; use of forests for public recreation.

IT DECLARES THAT FORESTRY is of immense importance to the people, that the census of 1913 shows our forests annually supply over one and a quarter billion dollars' worth of products; employ 795,000 people; pay $267,000,000 in wages; cover 850,000,000 acres unsuited for agriculture; regulate the distribution of water; prevent erosion of lands; and are essential to the beauty of the country and the health of the nation.

IT RECOGNIZES THAT forestry is an industry limited by economic conditions, that private owners should be aided and encouraged by investigations, demonstrations, and educational work, since they cannot be expected to practice forestry at a financial loss; that Federal and State governments should undertake scientific forestry upon National and State forest reserves for the benefit of the public.

IT WILL DEVOTE its influence and educational facilities to the development of public thought and knowledge along these practical lines.

It Will Support These Policies

National and State Forests under Federal and State Ownership, administration and management, respectively; adequate appropriations for their care and management; Federal co-operation with the State, especially in forest fire protection.

State activity by acquirement of forest lands; organization for fire protection; encouragement of forest planting by communal and private owners, non-political departmentally independent forest organization, with liberal appropriations for these purposes.

Forest Fire Protection by Federal, State and fire protective agencies, and encouragement and extension individually and by co-operation; without adequate fire protection all other measures for forest crop production will fail.

Forest Planting by Federal and State governments and long-lived corporations and acquirement of waste lands for this purpose, and also planting by private owners, where profitable, and encouragement of natural regeneration.

Forest Taxation Reforms removing unjust burdens from owners of growing timber.

Closer Utilization in logging and manufacturing without loss to owners; aid to lumbermen in achieving this.

Cutting of Mature Timber where and as the domestic market demands it except on areas maintained for park or scenic purposes, and compensation of forest owners for loss suffered through protection of watersheds, or on behalf of any public interest.

Equal protection to the lumber industry and to public interests in legislation affecting private timberland operations, recognizing that lumbering is as legitimate and necessary as the forests themselves.

Classification by experts of lands best suited for farming and those best suited for forestry; and liberal National and State appropriations for this work.

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"THE HALL OF FAME FOR TREES"

The Old Red Oak at Lloyd's Neck

This beautiful old tree has been nominated for a place in the Hall of Fame for Trees with a History by Col. William E. Rogers, of Washington, D. C. It is located on the property of Mr. Walter Jennings, at Lloyd's Neck, on the North Shore of Long Island, and Colonel Rogers, whose old home is at Huntington, has known the tree well since he was a boy. In Revolutionary days the British occupied two strongholds on Lloyd's Neck—East Fort and West Fort—from which they levied tribute on all the surrounding country and which were for a long time their bases of supply. The oak is located about midway between the two forts, facing Halesite, a spot of historic fame because it was here that Nathan Hale, who only regretted that he had "but one life to lose" for his country, was finally captured. If the old oak could talk, it could doubtless tell many a thrilling tale—first of the earliest possessors of the land, the Indian braves; then of its settlement by the whites and of its later occupation by the British military forces and finally, years later, of the calm and peaceful days during the administration of President Martin Van Buren, who with his close friend, C. C. Cambreleng, the then minister to Russia, and Washington Irving, spent a great deal of time in the vicinity enjoying the fishing, than which there was none better. The old giant is 16 feet 8 inches in circumference three feet above the ground, by measurements taken three years ago, and the spread of its branches is 150 feet. It has been pronounced by experts to be at least 400 years old and Dr. Britton, of the New York Botanical Gardens, considers it the largest and finest specimen tree in the East. For a tree of its unquestioned age, its symmetry and beautiful form are remarkable.

AMERICAN FORESTRY

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FORESTRY AS A BUSINESS

By George H. Rhodes

Secretary, California Forest Protective Association

BEFORE the advent of man, land produces in accordance with natural conditions. After his advent, it gradually comes under cultivated or controlled production.

The continued prosperity and progress of a people depend very much on the use they make of the land. That on which annual crops will grow comes first under controlled production and cultivation. The areas which will not produce annual crops or which cannot be cultivated are the last to come under controlled production.

Forest and grazing lands form the greatest part of the latter areas, and, as natural conditions disappear, both require increasing attention to insure their continuous production under a certain necessary amount of control. Forest lands differ from all other lands in the period of time necessary to grow a crop. This makes necessary an adjustment of economic conditions to meet that peculiar fact. The first economic condition to be dealt with is the area of forest land necessary to meet the continuous needs of the people for forest products. If the time required for a crop to grow is 100 years it will require 100 times as much land as is necessary for an annual crop, since only one - hundredth of the crop can be harvested each year.

VIRGIN PINE, FIR AND CEDAR IN CALIFORNIA

There are taxation units in which the stand of virgin timber is inaccessible and will not be operated for years, hence a yield tax on timber would deprive the county of necessary annual revenue.

If 60 billion board feet of lumber are needed and an acre will yield 15 thousand feet average, then 4,000,000 acres must be cut over. With an annual crop this 4,000,000 acres could be harvested again the next year, but with timber this 4,000,000 acres cannot be harvested again until 100 years or more hence; therefore, 100 times this area or at least 400,000,000 acres of forest

land will be necessary. Having the necessary area of land the next economic adjustments are those covering carrying costs—taxes, interest, protection, planting, administration, etc., all of which must go on every year until the crop of timber is harvested and must finally be paid by those who consume or use that crop. Unless they can pay those costs the crop will not be produced because it will not pay. Herein lies the essential economic difference between virgin timber and grown timber which inevitably causes the latter to cost more and to decrease in per capita consumption.

Since these carrying costs will be paid by the ultimate consumer, the important question is, who shall assume them during the long-growing period?

Since the future users of forest products will pay the costs of growing the trees, in addition to the costs of manufacturing and distributing the lumber or whatever it is they need, there is no doubt that these costs will be paid in the end. During the long growing period they can be assumed by either private or public interests, or by both. Knowing that they will ultimately be paid, we can assume that neither private or public interests will lose on account of the carrying costs to provide forests for the future. In other words, it will be done on a paying basis, or at a profit.

Therefore it is not a matter of sentiment but a business proposition. Being a business proposition it must have all the elements of successful business, and this must apply to government as well as to private forestry.

This means that, from the beginning, every item of cost necessary in the growing of timber must be taken into consideration as accurately as possible. And it means also that all the relationships and interests involved in the distribution of these costs must be given their proper place .

The items of these carrying costs are: Reforestation, either natural or by planting or seeding; protection, administration, taxes and interest. It is apparent that the first three will be the same to public or private interests, since either the government or a private owner will have to provide a stand of timber, if necessary, protect it from fire and other loss or damage, and carry on the business necessary to do these things. Administration includes also such studies and experiments as must be carried on to secure better methods of forest management and closer utilization of products. As to these items there will be only slight variations between public and private forest management. They will differ in different forest regions, but will be about the same for all in any given region, and will become standardized and quite reliable with the passing of time, so that their bearing on profitable forestry will become less and less uncertain.

The remaining two items, taxes and interest, have elements of uncertainty as to their amount and their incidence as between private and public forestry practice.

It is good business to understand these uncertainties as much as possible and to establish conditions that are essentially equitable among all interests and relationships. Since taxes and interest cannot be extinguished it follows that, if they can be avoided by one party by a

A CALIFORNIA MOUNTAIN RANCH

"The continued prosperity and progress of a people depend very much on the use they make of the land." This California mountain ranch has been cleared and will be used for farming, while the other cut-over land is reforesting and is used for timber growing. Originally this was a dense redwood forest.

THE DEEP, COOL SHADOWS OF A REDWOOD GROVE

Among the incidental public benefits of forests are health and recreational advantages that justify all the people in sharing the costs of protection and perpetuation.

process of shifting the burden, it will fall on the other party so heavily as to tend to put him out of business. This phase of forestry, in its bearing on the question whether it can be carried on by both private and public interests must be discussed frankly and fully.

As to interest, there is no question that private forestry must take it into consideration. The same money could be deposited in a savings bank at 4 per cent, compounded semi-annually, without risk or attention. Or, it could be invested in productive industry, involving some risk and attention, which would justify a rate of at least 6 per cent, compounded annually. Timber growing, being a productive industry carrying the same conditions, would be entitled to the same interest.

This interest would accrue on the investment in the land, the initial cost of securing a full stand of timber, and the annual costs of administration, protection and taxation.

Here arises a consideration bearing on private forestry that must not be overlooked. It can be carried on in connection with a manufacturing business or separately. If carried on in connection with an established lumber manufacturing and distributing business, private forestry might be practiced at a less rate of interest than when practiced separately. Unquestionably forest renewal in connection with an established manufacturing and distributing plant will operate to make that plant and business permanent instead of temporary, to make it continuous instead of vanishing. On this account a value will accrue to the plant and business that will absorb some of the interest rate. Under certain favorable conditions this absorption might reach nearly 100 per cent. In other words, the value incident to making an industry permanent might offset the interest charges. But private forestry separate from the conversion and distribution of forest products is another thing. It must show a profit on merely growing the timber, just as the growing of agricultural crops must show a profit on production separately from manufacturing. In this interest on every dollar invested or expended must be allowed, if loss is to be avoided. This will apply to all cut-over or other forest land not owned in connection with and as a part of a manufacturing business. If this can be done with reasonable assurance and some prospects of profits besides, it will be practical. If not, then private forestry on such lands cannot be carried on.

As to public forestry, whether practiced by the Federal or State government, it is a common fallacy to say that there will be no interest to pay. To prove that this is a fallacy it is only necessary to remember that

capital is always worth something, whether used by public or private interests. If the government did not use the money for forestry it could use it for something else. If it did not need the money it could decrease taxes and leave it for the people to use. This is clearly true of the expenses involved, but how about the land? Will the government have an investment on which to pay interest?

The government can acquire forest land in three ways—by purchase, by forfeiture and by reversion. Under purchase there is no doubt about the investment and interest must be calculated from the beginning, and unless it is desirable or advantageous to discourage private forestry, the rate of interest for the government must be the same. Land acquired through reversion or forfeiture, if it can be used for forest growing, has a value for that purpose, and interest must be allowed on that value. If it is worthless for that purpose it has no value as forest land, hence does not come within the pervieu of this discussion.

Forest land reserved by the U. S. Government has the same value it would have had if not reserved The government simply takes the place of a private owner, which makes no difference in the use or value of the land. Hence interest must accrue on that value which it would have had under private ownership.

NATURAL REFORESTATION OF PINE TIMBER IN CALIFORNIA

Costs of taxes, interest, protection, etc., must go on every year until the crop of timber is harvested, and must finally be paid by those who use that crop.

The government cannot escape interest on investment because it will always be using land withheld from the people, or money taken from the people by taxation, for forest production. And there is no reason why the rate of interest should not be the same, unless private forestry is to be discouraged.

While the government, national or state, cannot escape interest as going into the stumpage value of grown timber to be paid eventually by the consumers, it can escape taxation by simply refusing to pay. Unlike a private owner, it cannot be compelled to do so. With all other financial considerations almost equal, it is clear that such discrimination in taxation will operate to prevent forestry by private interests. The margin between profitable and unprofitable forestry, in all but especially favorable sections, is so narrow that exemption from taxation will be fatal to the interests not exempt.

This brings up the question again, whether it is desirable or not to encourage private forestry. If there is a certain area of forest land in a taxation unit, all privately owned and taxed at a certain amount per acre, and the government, state or national, acquires half of it, then the taxes on that remaining in private ownership will be doubled. In this way the government can cause the forfeiture of much privately owned forest land and almost prevent the practice of private forestry. On the other hand, if the government will pay its just and equitable share of the annual taxes it will encourage the practice of private forestry. In other words, if both private and public forestry are to go along hand in hand, the burden of taxation must be shared as nearly equally as possible. In order to secure this it might be claimed that all growing timber and the land on which it stands should be exempt from annual taxation, but subject to a yield tax at the time the timber is cut. This must be considered, however, from the standpoint of the taxation unit in which the forest-growing land is situated. That taxation unit, be it state, county, parish, district or municipality, must have annual revenue and that revenue must be certain. A yield tax alone will not supply certain annual revenue. If in a taxation unit there is an area of timberland subject to a yield tax and another area subject to an annual tax, the former can exist only because the latter is taxed every year. The latter carries practically the whole burden.

Now, if it were all placed under a yield tax then the burden of annual taxation on the other taxable property in the taxation unit would be correspondingly increased, which would be more inequitable and unjust than if only a part of the forest-growing land had been exempt from annual taxation under the yield tax.

It comes back to the proposition that all forest-growing land, whether publicly or privately owned must pay a certain annual revenue to the taxation unit in which it is located. In no other way can the carrying of an unfair share of the expense of supplying forests for the future by local taxation units be avoided. Of course

if timber were being cut in every local taxation unit under such conditions that the annual production would be uniformily certain and continuous, then a yield tax on both public and privately owned timber might be arranged. But there are such variations from this condition that a yield tax alone cannot possibly fill the requirements of certainty in annual revenue. There are taxation units in which the stand of virgin timber is inaccessible and will not be operated for years, hence a yield tax would practically exempt that timber from annual taxation and cause a corresponding increase in the burden on other classes of property. On the other hand, there are taxation units in which practically all the virgin timber has been cut and the young timber on these cut-over lands will not reach maturity in years, hence under a yield tax would pay no annual revenues. Between these two extremes are varying conditions and once in a while a taxation unit in which a yield tax on all timber would not make any serious difference, as compared to present conditions, but even there it would be only temporarily adequate and certain, and for that reason not practical.

It follows that the only solution is such an adjustment between a yield tax and an annual tax in such a way as to meet, as nearly as possible, the necessities of local taxation units and the economic conditions under which forests must be grown.

The first consideration in regard to a yield tax on timber is the part of the stumpage value of the timber that should be paid to the local taxation unit. Or, to what part of the stumpage value of timber at the time it is cut is the local taxation unit justly entitled?

In a state where there are no National Forests this is a simple problem because all timber can be taxed the same. Although there are no National Forests there might be state forests, but the taxation on these and the privately owned forests could be made uniform under state laws. It would all be under state control and there would be no problem of adjustment as between state and national interests.

In such a state let us suppose that 10 per cent of the stumpage value of timber at the time of sale is to be paid in taxes, or that the rate of taxation on timber is 10 per cent of the stumpage value, to be apportioned to the state and local taxation units as provided. This should apply to both state and privately owned forest land so that both will be under the same financial burdens and contribute equally to state and local revenue. It might be claimed that the state is growing timber for the public benefit, but it is not. It is growing timber for the use and benefit of those who will need it in the future, and they will have to pay for it, including taxes with other costs. Certainly there will be incidental public benefits, such as protection of watersheds, health and recreational advantages and contributions to general living conditions, which will be the same from state and privately owned forests.

With state and private interests paying a yield tax of 10 per cent, each will have 90 per cent of the stumpage value remaining, out of which must be paid the interest

NEAR YOSEMITE VALLEY, CALIFORNIA

There are certain incidental public benefits from forests, whether publicly or privately owned, such as protection of watersheds and contributions to general living conditions.

on investment and all the carrying costs from the beginning. Suppose this leaves a profit. The private owner, of course, can use his as he sees fit, just as the growers of grain or corn can use theirs. The state can do the same, using its profits to buy more forest land or to build highways, or make other improvements.

There will be no trouble about using the profits of timber growing either by state or private interests. The important thing is that both be under the same system of taxation, if both state and private forestry are to be carried on.

While there might not be a profit when the timber is sold in the future, there must be entire liquidation of the carrying costs, taxes and interest. Nobody, neither the state nor private interest, is going to furnish forests for the future at a loss. Whatever the costs, they will have to pay. For this reason a yield tax of 10 per cent of the stumpage value of timber may be too high. I am inclined to think it is, because it is greater than the percentage of gross value of other crops taken for taxes, and it simply adds to the price that must be paid for lumber in the future.

This yield tax, whether it is 5 or 10 per cent, must be considered from the standpoint of the taxation units. They must have certain annual revenue. Under a yield tax on timber a taxation unit may have no annual revenue for many years, and it surely will never be certain. To remedy this there should be a flat annual acreage tax on the land, to be deducted from the amount of the yield tax when it is paid. In other words, there should be an advance payment on the land to meet the requirements for certain annual revenue, the final yield tax to be decreased by the total amount previously paid. Gradually, as the area of forest-growing land becomes stabilized and the annual cut of timber approaches uniformity, these two features of such a taxation system will be adjusted to meet conditions.

Let us try to visualize an example to show just how such a combination acreage and yield tax would work. Take a county (as a taxation unit), in a state in which there are no national forests, but where the state has adopted laws providing for state acquisition of forest lands and their reforestation and protection.

In this county there are 100,000 acres of land, of which 30,000 acres are forest land. Of this forest land 15,000 acres, privately owned, carry virgin timber, and 500 acres are being cut over every year, yielding 15,000,000 board feet of lumber, with a stumpage value of $3 per thousand feet, or $45,000. This timber and the land has been privately owned for 40 years, and the annual taxes paid up to this time amount to $5 an acre. The average stand per acre is 30,000 board feet, worth $90. A yield tax of 10 per cent would be $9, from which the $5 previously paid should be deducted, leaving $4 an acre, or $2,000 on the 500 acres cut, to be paid as the balance due in taxes on that 500 acres. If the amount previously paid in taxes were $7 an acre, then the remainder to be paid would be $2 an acre; if the previous payments amounted to $3, then the remainder due would be $6 an acre, etc. In some cases the previous payments might be more than the 10 per cent yield tax, and so nothing would be due the county. The figures for no two taxation units would be the same, and yet it would work out equitably except in those few cases where the previous tax payments were greater than the yield tax.

The other 15,000 acres of forest land in this county carry young timber, 10,000 acres being owned by the State and 5,000 acres by private parties. All of it is protected from fire and is being brought up to full forest production as rapidly as possible. In addition to the yield tax there is a flat acreage tax of 10 cents an acre on all the forest land, which would yield an annual revenue of $3,000 on the 30,000 acres, this annual acreage tax to be deducted from the amount of the yield tax at the time when the timber, either original or grown, is cut. It is to be noted also that all this forest land is under the same system of taxation, both the State and privately owned. And why should there be any difference?

Both the state and the private owner are using land for the production of a necessity. That product is growing under the same natural conditions, whether on state or private lands, requires the same care and protection, and will be marketed finally under the same economic conditions as to use and value. In other words, it will be sold under the laws of supply and demand, which will not vary whether the products come from public or private lands. The lands on which these forest products grow, both public and private, are located within the boundaries of a county and both receive equal benefits of the county government, such as the protection of property, the administration of justice, the educational system, the activities for progress and development, etc. In every conceivable way these benefits will be equal to both the public and private forest land, so why should both not contribute equally to the necessary funds for the county, or other taxation unit?

Both the state and the private owner are working under the same natural conditions to do the same thing—grow timber—and there is no reason why they should not work under the same economic or financial conditions. If the state forest land is to be exempt from annual taxation, then the annual tax on the privately owned forest land will be doubly heavy. If both are exempt then the other taxable property in the county will have to carry the burden, which will be absolutely unjust. As the ultimate consumers will have to pay the costs of growing the timber, whether on public or private lands, let these costs include the taxes on all these forest lands necessary to pay their just share of the expenses of maintaining the local government under which the timber was grown.

THE CREATION OF THE EASTERN NATIONAL FORESTS

By W. W. Ashe

Secretary, National Forest Reservation Commission

ELEVEN years ago the great area between northern Alabama and Maine, including the most accessible and heaviest stands of hardwoods in the United States, was without a National Forest. Today within this area the purchase of 2,148,000 acres is being consummated under the authorization of the National Forest Reservation Commission. The Act under which purchases are being made was passed after more than ten years of agitation on the subject and after numerous bills had been introduced, only to be turned down by committees. As finally passed on March 1, 1911, the so-called "Weeks Law" restricts purchase to such forest lands as are influential in protecting navigable streams. It consists of two parts. One provides for cooperation in forest protection between the Federal government and such states as meet certain conditions; while the second authorizes the purchase of lands which have an influence upon maintaining the navigability of streams. It is thus seen that the measure is comprehensive. It was realized that it would not be possible or even practicable for the Federal government to acquire all forest lands which might be influential in the protection of our many navigable streams. For this reason the feature embodying cooperation between the Federal government and the states in the protection of lands against fire was incorporated with a view to extending the beneficial influences of the forest in this respect. This has proved a wise provision and has undoubtedly led many states which otherwise would not have acted to make the required appropriations to secure the benefit of Federal aid. The provisions for purchase were well hedged with safeguards. It is required that the Geological Survey shall first determine that the areas selected for purchase are of such a character that the navigability of streams will be promoted through the protection or maintenance of forests thereon. The law creates a commission consisting of the Secretary of War, who is president; the Secretary of Agriculture, the Secretary of the Interior, two members of the Senate and two members of the House of Representatives, and it is necessary for this commission to authorize the acquisition of any lands before they can be purchased. This commission began functioning in 1911 and it is fortunate that two members of the original body still serve and are acquainted in detail, through personal inspection, with much of the land which has been acquired.

HILLSIDES ONCE HEAVILY FORESTED

Now denuded, gullied and unprofitable. So sterile that they do not even afford scant pasturage for sheep. The soil that each rain removes from their slopes fills the channels of our streams, and necessitates the constant expenditure for dredging for its removal. The eastern National Forests are designed to correct and prevent such conditions as this.

It is further necessary that the states within which purchases are to be made shall give their assent thereto by appropriate legislation. Although the commission under the general Federal statutes and the Acts of consent passed by the several states has ample authority to acquire lands by condemnation, it has as a rule been its policy to resort to condemnation only in cases where the title situation was such that it was not possible to acquire a clear title fron the proponent, and seemingly the ostensible owner of the property, without resorting to the courts. The lands consequently have been acquired and prices fixed as a result of direct negotiations with the owners. Lands are acquired only within definitely located areas with a view to assembling a minimum area of 100,000 acres, or one which will admit of economic administration. These areas are called "Purchase Units," but when sufficient land is purchased the President proclaims them National Forests and they are then administered in the same manner as other National Forests.

The total area of the forest lands now acquired and being acquired under the authorization of the commission is 2,148,648 acres. These lands are located in eleven states. In ten states the forests are being built up entirely by purchase unless exception be taken to the Alabama National Forest, within which there was a meager nucleus of 18,000 acres of public domain around which

THE COLUMN OF SMOKE BY DAY HERALDS DESTRUCTION AND WASTE

It may be the accumulated growth of a century which is disappearing. It may be the waste and lappage which the lumbermen have left behind, with young trees and all possibilities of a fu ure forest. In either case it is economic loss.

have now been assembled an area of five-fold extent. In one state, Arkansas, purchases have been designed merely to consolidate the Government holdings on the Ozark and Arkansas National Forests which were created from the public domain. Until recently purchases have been restricted to the White Mountains in New Hampshire and Maine, the Appalachians south of Pennsylvania, and the Ozarks of Arkansas, but the commission has recently authorized the purchase of 74,000 acres in Pennsylvania.

The original program called for the purchase of 6,000,000 acres, one-third of which has now been acquired. In the White Mountains the purchase program is about one-half completed, there having been acquired about 450,000 acres out of a total designated area of 950,000 acres.

The larger portion of the lands which have been acquired have had the timber cut off, or at least some of the best timber has been cut, but a number of fine stands have been secured within which there has never been the sound of the lumberman's ax; and there is valuable timber on much of the other lands in addition to much timber of low grade. There are some large tracts which have been badly injured by repeated fires. Their value for watershed protection had been greatly impaired through the destruction of the absorbent forest humus and the resulting erosion; and likewise their capacity for growing timber had been reduced. In places the protection which has been given by the government has already resulted in a wonderful change in some of these burned over lands. There are also small areas of open land which at one time were fields on farms. The owners found such lands were too steep for permanent and profitable cultivation. Many of these little mountain clearings are so deeply gullied that it will be years before the gullies will fill up and the surface again become smooth and the original fertility of the soil restored. Most of these open lands are gradually restocking in trees by seed from the nearby forests. There are also small and relatively insignificant areas of barren lands, largely mountain tops and sub-Alpine lands, which were acquired in purchasing larger tracts of which they formed a part. But on the whole, 95 per cent of the more than two million acres is productive forest land or is

potentially productive requiring merely protection from fire for a reasonable time. On the recently established Allegheny Purchase Unit in Pennsylvania there are considerable areas of badly burned land, but it is believed that even these areas can eventually be made to contribute to the needs of the highly developed industrial region within which this purchase unit is situated.

The government began purchases in the White Mountains just in time to assure the preservation of their forest cover, for, following the example of the government in protection, several owners of large holdings in these mountains are likewise carefully protecting their lands from fire as the timber is cut off; thus permanency of forest cover has been assured. Some concerns are even employing, at least in part, the government's methods of conservative cutting. It is not intended to imply that the fine stands of old spruce have been preserved throughout the White Mountains, although this has been done in part within some of the highly scenic areas such as Tuckerman's ravine, on the slopes of Mt. Chocorua and within the Great Gulf. But these mountains have been saved for the use of the people before they were stripped of their trees and before their surface was burned over and made a dreary waste such as has been the fate of much of the once fir and spruce clad slopes of the Black Mountains in North Carolina and of portions of West Virginia. The pointed fir still maintains its verdure and although much of it is in young stands, these have followed mature forests which supplied natural and economic needs. In due time they too must fill their highest utility. But for the inauguration of the government's policy of purchase and protection in the White Mountains it is probable that a large portion of the lands there would have been closely stripped of timber on account of the high prices which prevailed for wood, even of small size, for the manufacture of paper. Once these lands were rendered unproductive, on account of their closely cut condition, they would have been neglected, if not abandoned; would have been ravaged by fire, and left in a desolate condition, such as actually has been the case within restricted areas. There are certain lands, especially at high altitudes, on which it may not be desirable to cut any timber, or, if cut, the fellings must be conservative, since the protective function of the forest is of paramount consideration on such sites. The general policy, however, will be to cut the timber in such manner as to stabilize the yield and thus promote the establishment of permanent woodworking industries in place of the transient operations which have heretofore characterized the region. The result of protection to the cut-over lands is finely shown in many places in the White Mountains In no place, however, is it better exemplified than on Hubbard Brook in the town of Woodstock, Grafton County. Here a wonderfully thick and most beautiful stand of young spruce trees has established itself. It is already a solid mass of green 10 to 15 feet in height. Within a few years as the trees become larger the moss will again form a velvety rug and the dense thicket of saplings will open up into the mature forest with its dense shade ever

THE ABUNDANT GENEROSITY OF NATURE

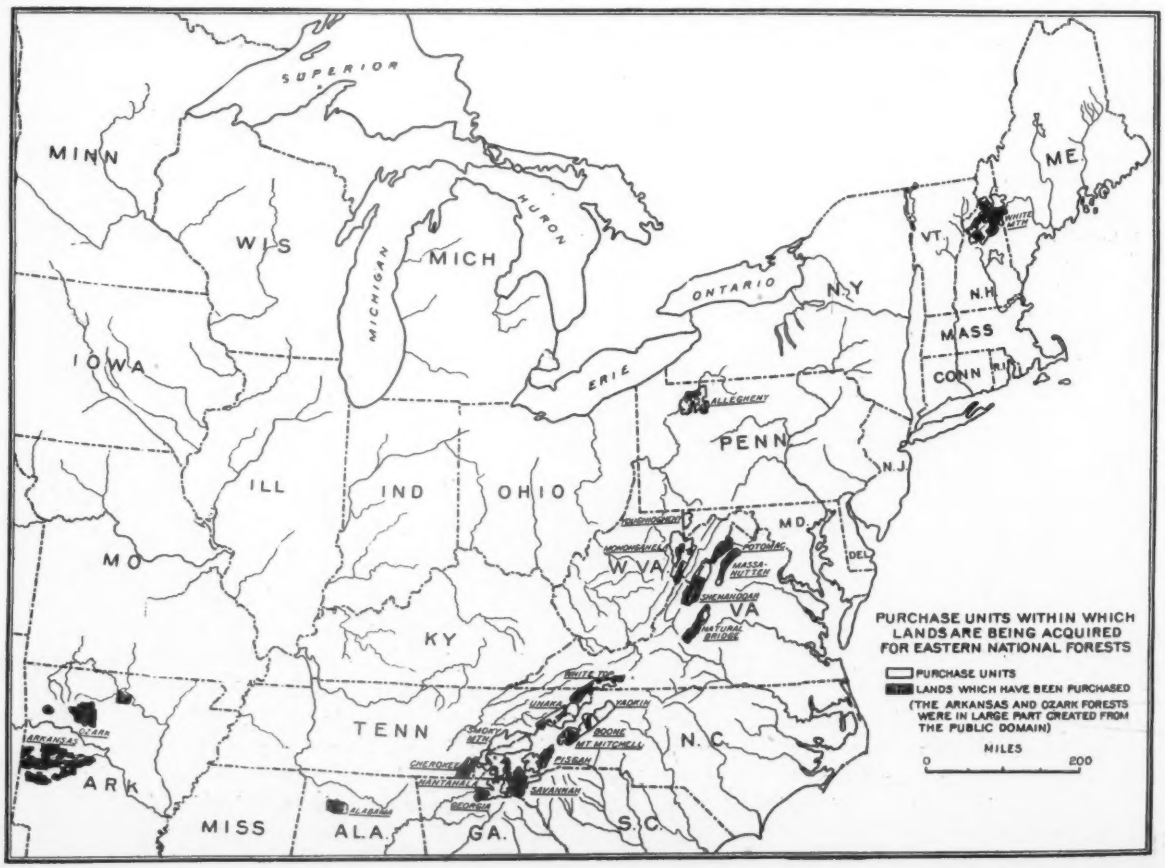
On land which has been cut over under the Government's directions the pointed fir still maintains its verdure. These young stands have followed mature forests which supplied natural and economic needs.

alluring the tramper to further explore its cool and refreshing recesses.

The White Mountain National Forest is designed to protect the headwaters of the Connecticut, Saco, Merrimac and Androscoggin Rivers. Although the Merrimac is navigable and has important water traffic in coal and petroleum, it is chiefly noteworthy as having its water powers highly developed and for the large number of textile mills which line its banks. The total possibilities of the stream developed and undeveloped, in New Hampshire and Massachusetts, exceed 100,000 horsepower; while those of the Androscoggin in Maine and New Hampshire amount to 260,000 horsepower.*

One of the most important streams heading in the southern Appalachians is the Tennessee River, on which is located the Muscle Shoals which with other nearby power sites has around 1,000,000 latent horsepower possibilities.** The main channel of the Tennessee River is navigable for a distance of 650 miles above its mouth where it joins the Ohio. The annual traffic upon it amounts to three quarters of a million tons. Its headwaters are in southwestern Virginia, western North Carolina, northern Georgia, and southwestern Kentucky, and are in part protected by five National Forests—the White Top, Pisgah, Savannah, Georgia and Alabama. All of these forests are within the field of heavy rainfall as much as twenty inches having fallen within two days' time at certain points. There is relatively little snow and consequently the soil where unprotected by forest is subject to the devastating influence of concentrated precipitation practically throughout the entire year. The result of this is that erosion is here excessive and sedimentation in the channels of streams is a serious problem. This condition is not limited to the Tennessee River but also applies to other streams which have their source in this region. Some of these like the Black Warrior, one of the important rivers of Alabama whose headwaters are in part protected by the Alabama National Forest, are important power streams as well as having been developed for navigation by a costly system of locks.

The flood situation on the Ohio River has long been a matter of serious concern to the National Forest Reservation Commission. Special consideration has been given to the situation at Pittsburgh. This led the commission to authorize the establishment of a purchase unit in Pennsylvania on the headwaters of the Allegheny river, since it seemed desirable that the watershed of the Allegheny be protected as well as the Monongahela River, the southern headstream of the Ohio. Thus it inaugurated the principle of protecting on the Ohio River both of its head streams which unite at Pittsburgh. The plans for the control of flood waters on these streams called for the establishment of a series of storage reservoirs and in order to secure permanently full benefits from such reservoirs it is essential that erosion be reduced to a minimum to prevent the loss in storage through silting. It was not until 1921 that the legisla-



ture of Pennsylvania authorized purchases in that state for National Forests by the Federal government. The establishment of the Allegheny Purchase Unit was the result. This unit has a gross area of more than 400,000 acres, within which the purchase of 74,000 acres has just been authorized by the commission. This unit, which in time will become a National Forest, will very largely protect the drainage basins tributary to two of these proposed reservoirs on the upper waters of the Allegheny River. Within its borders is the seat of the last white pine operation of magnitude in Pennsylvania.

Neither should the recreational advantages of the eastern National Forests be overlooked. While the purchase of scenery and trout streams has not been an objective, it is nevertheless true that there is much on the purchased forests to lure the vacationist. Mr. Thomas H. Gill has recently considered their recreational features in the May issue of *American Forestry*. He particularly calls attention to the accessibility of the eastern National Forests to the massed population of the Atlantic Seaboard. They are located from Maine to the mountains of northern Alabama and Arkansas and are within easy reach of four-fifths of our population; and offer varied conditions and sports to the vacationist.

While the underlying function which has guided the selection of the areas within which lands are being acquired is the protection of navigable streams, and for that reason it has been necessary to restrict purchases to the rougher and mountainous lands or such as are a menace through erosion, their value for timber production has not been lost sight of. Since the enactment of the Act there have been radical changes in the economic timber supply situation in the eastern states. Ten years ago southern yellow pine controlled the eastern market for structural wood. Today it is realized that the zenith of yellow pine production has passed, that its cut is well on the wane and the field which it has lost has been taken by woods from the northwest coast. This condition leads to the realization of the impending crisis which must soon be faced in the East when the greater part of the timber required for its industries must be brought from a great distance with the accompanying high freights. Pennsylvania, at one time producing timber for export, now manufactures only one-fifth of the lumber required by the state. Ohio, another leading industrial state, produces within its borders only one-eighth of that required. Illinois, formerly dependent entirely on timber from the nearby states to the north, now pays a freight tax of more than twenty-five million dollars a year to supply its needs by bringing timber from a distance. Still further changes are imminent. With a further reduction in the supply of yellow pine timber it will become necessary to fill its place with material from a greater distance. To assist in meeting this situation, the eastern National Forests should be greatly expanded. It is necessary that this enormous area of cut-over land, now largely unproductive, should be placed on a productive basis as soon as possible that it may be adequately protected and managed with a view to meeting this impending timber shortage.

The adequate expansion of the eastern National Forests and the maintenance of the forest lands of the East on a producing basis is as essential to Pennsylvania, Ohio, New York, and Illinois, which are large consuming states, as it is to the states within which the large forest areas are located. As a matter of fact these are the states which will profit most, since the regenerated forests will assist in supplying timber for their industries and domestic needs. It means not only the maintenance of their wood-using industries but an enormous saving in freight.

Looking toward the continued growth of these forests the National Forest Reservation Commission at its last meeting went on record without a dissenting vote of those present, in favor of a yearly appropriation of $2,000,000 for the purchase work. This would be a return to the prewar basis, the original appropriations being at the rate of $2,000,000 a year.

**Report Commission of Water Conservation of New Hampshire, 1911, 1918.*

***J. C. Welliver in Am. Rev. of Rev., April, 1922.*

From the United States Forest Service, Intermountain *Daily News,* comes this cheerful bit of philosophy:

BE THE BEST OF WHATEVER YOU ARE

"If you can't be a pine on the top of the hill,
Be a scrub in the valley—but be
The best little scrub at the side of the rill;
Be a bush if you can't be a tree.

"If you can't be a bush be a bit of the grass,
Some highway to happier make,
If you can't be a muskie then just be a bass—
But the liveliest bass in the lake!

"We can't all be captains, we've got to be crew,
There's something for all of us here;
There's big work to do and there's lesser to do,
And the task we must do is the near.

"If you can't be a highway, then just be a trail,
If you can't be the sun, be a star;
It isn't by size that you win or you fail—
Be the best of whatever you are."

THE AIRPLANE--"WATCH-DOG OF

By Stuart Moir, Assistant Forester, La

EXPERIENCE with the airplane during the recent fires in the St. Maurice Valley of Quebec proves its value as the fire-fighter's aid. Just as airplanes were used during the war to reconnoitre enemy positions so they have demonstrated their worth as a means of scouting forest fires. A daily aerial reconnaissance of the forest fires, which the writer was fighting with the aid of 60 men, supplied the information which enabled him to get it under control. The type of machine used was an H. S. 2. L. flying boat equipped with a 330 H. P. motor.

FOREST FIRE AND ITS WORK

Upper—Hopping off again after landing the daily supply of provisions and reporting on the progress of the fire-fighting.

Middle—As the aerial observer sees it. Note how well the lakes and streams show up in respect to the direction of the fire.

Lower—A twenty-five year old Balsam Fir stand after it was swept by fire. Not a single young tree remains alive.

On May 30th word was brought in by the patrol of the Laurentide Air Service, contractors for aerial work to the Laurentide Company, Limited, that a serious fire was burning along a six mile front north of Lakes Grand Chienne and Big Eagle. Men were immediately ordered to go to the fire by land route and to take two weeks' provisions. The following day a flight was made to reconnoitre the burning area north of Lake Chienne and to determine the best means of combat. As soon as the plane had reached its altitude huge columns of smoke were seen rolling skyward to the west and north, and when within 50 miles of the fire, the air was pungent with the odor of burning Spruce and Balsam.

Flying at 3,000 feet it was possible to see the outline of the fire in detail and to decide exactly where the fighting gangs should be placed to do most effective work. Although only 70-80 minutes were required to fly from the base to the fire, two days were consumed by the first gang of 22 men taken from the nearest drive camp to arrive upon the scene of action. Travel by canoe and portage through rough country transporting equipment and provisions is slow and tedious work. Arriving late in the afternoon the men pitched their tents, made the camp, and prepared the fireplace for the cook. In any woods organization the cook is the king-pin in maintaining the morale of the gang.

At daybreak the following morning the men were attacking the fire at its most dangerous point. Trees were chopped, fire lines cut through the leaf litter to mineral soil, sand thrown on burning stumps, and logs to smother the fire and water used wherever available. It is hot gruelling labor, for fires must be strenuously fought to be mastered. The first break comes at 9 A. M., when one-half the gang is given a rest and something to eat—meanwhile the rest of the gang stick to the job and are relieved as soon as the others return to the fire line. Fighting continues until 2 P. M., when a halt is called. At 6 P. M.

rester, Laurentide Company, Limited

the struggle is resumed and lasts until dark. Most of the fires in this part of the country die down considerably during the night and in the early morning present only a smouldering line to the fire-fighter. The most effective work is done between dawn and 10 o'clock in the morning; as at that time the flames are fanned up with increasing fierceness.

An aerial observation of the fire was made each afternoon to determine the results of the morning's work, to note any new outbreaks, and to see what part of the line required immediate attention. Daily during the progress of the fire the airplane brought in supplies and equipment. Without its services the fire crews would have been hard pressed for grub, for the first gang was augmented by the arrival of drive gang Number Two, including 32 men and also several rangers and guides, making a total force of 60 men. The last party had purposely travelled light in order to make the trip as speedily as possible. Complete reliance had been placed in the airplane to bring up the necessary supplies and equipment. It never failed in its duty, weathering smoke, wind and rain, and all adverse flying conditions.

Many of the fire-fighters had never seen an airplane prior to the arrival of the patrol machine on Lake Chienne. Their exclamations of awe and admiration were amusing; they marvelled at its size, the rapidity of its descent to the water, and the ease and grace with which it alighted on the lake. The members of the gang who were fortunate enough to touch the body or wings of the machine were regarded as heroes by their comrades. In the future they will frequently see an airplane flying over the country, for the air patrol has come to stay as the watch-dog of Canada's forest resources.

The ability of an observer in an airplane to detect a small trace of smoke at a long distance has been strikingly illustrated. In a recent instance the observer saw smoke rising from a lake shore some twenty miles off the machine's course, and the plane was diverted to this. Examination proved it to be a case of brush-burning behind a camp. Knowing that men were present and that there was no hazard, the plane was continued on its journey.

The experience gained in the use of the airplane in fighting this fire proved it to be the most effective auxiliary available to learn the exact condition of the fire. Anyone who has fought forest fires knows what a number of false rumors and conflicting reports are brought to camp as to the location of the fire. A change of wind

THE FORCES AT WORK TO CHECK DESTRUCTION

Upper—A natural heritage being consumed by the demon fire because "somebody was careless."

Middle—No stove is needed by this cook in a woods camp. Bread and beans are baked in the sand, and other food over the fire.

Lower—Unloading provisions for fire-fighting forces at work on Big Lake Chienne.

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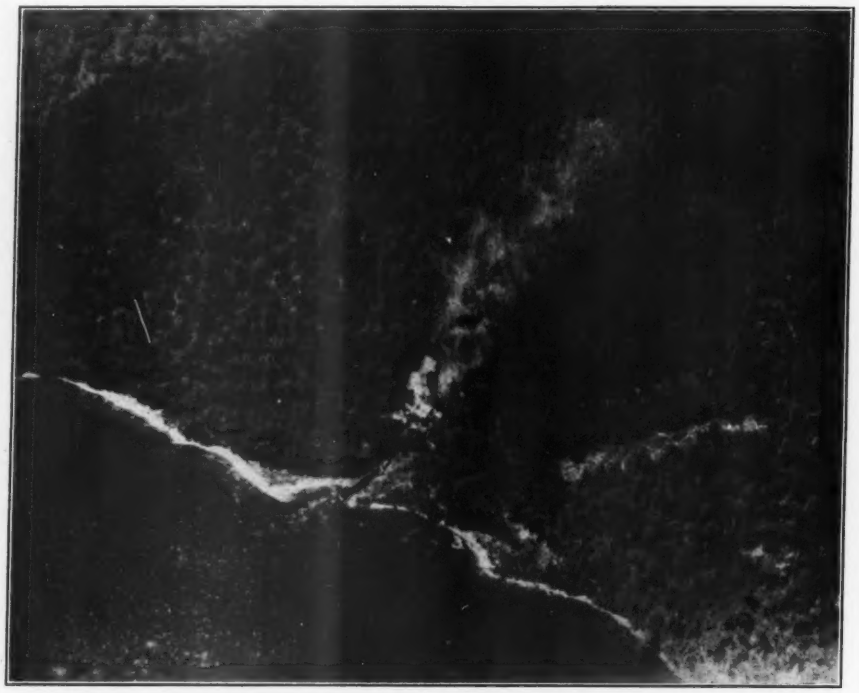

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IF only one bushel of wheat out of every four grown in the fields reached the consumer, the American public would have something to say the minute the price of wheat began seriously to affect the customary size of loaves in the Nation's bread boxes. It is safe to say that there would be an immediate and united effort to save the waste, and despite political and economic doctrinaires, the effort would obtain a large degree of success. As during the war, each of us, as demand outran supply, would feel a personal responsibility to aid in conserving the supply, and our individual and united efforts would accomplish wonders.

The Soap Box Test of the Public Mind

One may stand on a soap box at a street corner and with a few fiery and rhetorical sentences, punctuated by the brandishing of a loaf of bread made from grain grown in a few short months, incite a bread riot, but let him substitute for the loaf of bread a section of a board cut from a tree which it has taken 200 wheat harvests to grow, and he will have difficulty in drawing an audience. Such is the state of the public mind with respect to bread and boards. Perhaps one explanation is that bread riots are actualities, whereas board riots are as yet unheard of in this fair country.

The Fatal Figure Four

All of which does not alter the situation in regard to forest waste or the needed assumption of public responsibility which it demands. It merely accentuates the seriousness of it. We are told by no less an authority than the Forest Service, that only 30 per cent of the wood in the forest gets into the form of seasoned, unplaned lumber, and that of this amount an additional 10 to 25 per cent is lost in the process of further manufacture. In other words, 4000 feet of forest growth is sacrificed to American wood-using customs and demand for every thousand feet of wood placed in the consumers' hands. We not only destroy four times what we use, but we are using what is left of our forest heritage four times faster than it is being replaced by new growth.

The Public Has Its Faults

The fatal inevitableness of the course is apparent, but the public refuses to be concerned despite repeated warnings that four-fifths of our original forests have gone, that 60 per cent of that left is west of the great plains and that decade by decade the price of lumber is pushing upward. It persists in clinging to old demands and old customs handed down from days when forests were embarrassingly plentiful and forest waste was an economic order of the time. It adheres to a rigid position of wood particularity, regardless of its effect upon waste in the forest, and it recedes from that position only when economic changes force it to do so.

Watchful Waiting and Forest Waste

There are men, who, measuring the future by the past, assert that the development of better utilization of our forests is meshed in an economic gear. They maintain that when a market for material now wasted is available, this waste will be saved. They slur over the utilization phase of our forest problem with a taken-for-granted attitude that economic pressure is the only effective rectifier. They overlook the fact that this economic pressure must spring from a serious off-balance of supply and demand—the very situation we are trying to guard against.

This is a do-nothing attitude masked in affectation of economic learning. It is the quickest way of exhausting our forests, next to burning them up, and of accelerating the timber pinch. It can be justified only by admitting that our system is a one-gear machine, or that we have not the intelligence to change gears when a change is clearly necessary. It is an attitude which will never enlighten the public to the possibilities of relieving the drain upon our forests by developing a national conscience for wood economy.

The Octopus of Forest Depletion

Anyone who has gone very deeply into the situation with respect to forest waste in this country knows that it is the he-octopus of forest depletion. Its arms reach out into every industry and its suckers permeate the whole American wood-using public. Millions upon millions of feet of fallen timber are left to rot in the woods every year. Why? It may be one of many remedial reasons. It may be because the public continues to stand, year in and year out, for railroad tariffs which permits the railroads to charge the same rate for hauling low grade lumber valued, let us say, at $15.00 a thousand feet at the mill, as for higher grade lumber valued at $100.00 or more a thousand feet. When it does not pay to log and manufacture lumber, industry will not do it. More economics wrapped up in a flimsy tariff sheet.

Custom a Finicky Customer

Or, good timber will be left in the woods, burned, or degraded at the mill, or sold for fuel at the wood-using plant, because custom has so ordained. It has always been so, therefore it must be an economic rock which only the forces of dire necessity can alter. The public has been miseducated to finicky wood tastes, which often are at the root of forest waste. Old line industries have "educated their trade" and new line industries are out to "please the public," and all the time the public does not realize the folly of its way.

The Case of Grandmother's Spools

An example will serve to illustrate: A mill in the

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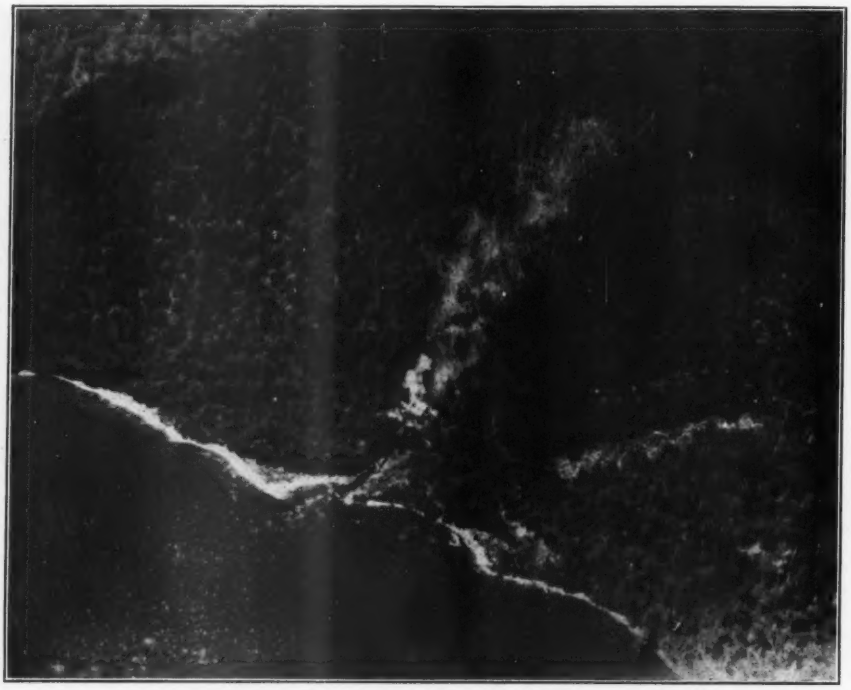

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One may stand on a soap box at a street corner and with a few fiery and rhetorical sentences, punctuated by the brandishing of a loaf of bread made from grain grown in a few short months, incite a bread riot, but let him substitute for the loaf of bread a section of a board cut from a tree which it has taken 200 wheat harvests to grow, and he will have difficulty in drawing an audience. Such is the state of the public mind with respect to bread and boards. Perhaps one explanation is that bread riots are actualities, whereas board riots are as yet unheard of in this fair country.

The Fatal Figure Four

All of which does not alter the situation in regard to forest waste or the needed assumption of public responsibility which it demands. It merely accentuates the seriousness of it. We are told by no less an authority than the Forest Service, that only 30 per cent of the wood in the forest gets into the form of seasoned, unplaned lumber, and that of this amount an additional 10 to 25 per cent is lost in the process of further manufacture. In other words, 4000 feet of forest growth is sacrificed to American wood-using customs and demand for every thousand feet of wood placed in the consumers' hands. We not only destroy four times what we use, but we are using what is left of our forest heritage four times faster than it is being replaced by new growth.

The Public Has Its Faults

The fatal inevitableness of the course is apparent, but the public refuses to be concerned despite repeated warnings that four-fifths of our original forests have gone, that 60 per cent of that left is west of the great plains and that decade by decade the price of lumber is pushing upward. It persists in clinging to old demands and old customs handed down from days when forests were embarrassingly plentiful and forest waste was an economic order of the time. It adheres to a rigid position of wood particularity, regardless of its effect upon waste in the forest, and it recedes from that position only when economic changes force it to do so.

Watchful Waiting and Forest Waste

There are men, who, measuring the future by the past, assert that the development of better utilization of our forests is meshed in an economic gear. They maintain that when a market for material now wasted is available, this waste will be saved. They slur over the utilization phase of our forest problem with a taken-for-granted attitude that economic pressure is the only effective rectifier. They overlook the fact that this economic pressure must spring from a serious off-balance of supply and demand—the very situation we are trying to guard against.

This is a do-nothing attitude masked in affectation of economic learning. It is the quickest way of exhausting our forests, next to burning them up, and of accelerating the timber pinch. It can be justified only by admitting that our system is a one-gear machine, or that we have not the intelligence to change gears when a change is clearly necessary. It is an attitude which will never enlighten the public to the possibilities of relieving the drain upon our forests by developing a national conscience for wood economy.

The Octopus of Forest Depletion

Anyone who has gone very deeply into the situation with respect to forest waste in this country knows that it is the he-octopus of forest depletion. Its arms reach out into every industry and its suckers permeate the whole American wood-using public. Millions upon millions of feet of fallen timber are left to rot in the woods every year. Why? It may be one of many remedial reasons. It may be because the public continues to stand, year in and year out, for railroad tariffs which permits the railroads to charge the same rate for hauling low grade lumber valued, let us say, at $15.00 a thousand feet at the mill, as for higher grade lumber valued at $100.00 or more a thousand feet. When it does not pay to log and manufacture lumber, industry will not do it. More economics wrapped up in a flimsy tariff sheet.

Custom a Finicky Customer

Or, good timber will be left in the woods, burned, or degraded at the mill, or sold for fuel at the wood-using plant, because custom has so ordained. It has always been so, therefore it must be an economic rock which only the forces of dire necessity can alter. The public has been miseducated to finicky wood tastes, which often are at the root of forest waste. Old line industries have "educated their trade" and new line industries are out to "please the public," and all the time the public does not realize the folly of its way.

The Case of Grandmother's Spools

An example will serve to illustrate: A mill in the

course of a season manufactures five million feet of birch for spool stock. Thirty per cent of the lumber proves to be so-called red-heart, but sound and perfectly suitable for spools. The spool factory refuses to accept it. The wood is off-color. Our grandmothers were educated to white wood spools and white wood spools our women folks must continue to have until there is no more white wood left. So the million feet of otherwise good spool stock goes into a burner or is sold to a pulp mill at fuel wood prices, while foresters, lumbermen, congressmen and statesmen disagree as to who will spend 50 to 100 years growing a new forest to make good the loss. Fine economics!

False Gods and Lack of a National Conscience

That example is not extreme. It is a modest conservative one. Others of similar tenor might be cited *ad infinitum*. In the aggregate, we are sacrificing one and perhaps two years' supply of wood every four years to false Gods of forest utilization. No single industry or set of individuals are to blame. The problem is a common one of research, education, and the determination to remove senseless obstacles. Forest utilization begins with the lumbermen and ends with the consumer, but back of it all there must be a public conscience against wood extravagance. If we wait for timber shortage to develop that conscience, it will be too late. The great need is now. The public must be brought to a new conception of the use of our forests. It must be enlightened as to the evil consequences of its present disregard for forest waste. Instead of complacency and ignorance, there must be a national sentiment to husband our remaining forests and to make them go as far as possible.

Removing Public Ignorance

For years, the Forest Service has been studying forest utilization and seeking to educate the wood conversion industries to needed and possible economies. Progress has been made, but it has been slow. Within recent years, there has been a marked awakening among lumbermen and wood manufacturers to the opportunities for saving wood and money through better utilization practices. Their biggest handicap, in many cases, is lack of public understanding and cooperation, and a public failure to show any interest or responsibility for wood extravagance or forest waste. So far as the public goes, ignorance is probably at the bottom of it all. Take the case of spools. It is inconceivable that the women of this country, if they realized the waste incidental to white spool traditions, would continue to demand that their thread be wound upon white wood spools.

In many of the larger utilization problems, the industries can get just so far and no further without the public's cooperation. There is a loud call and a great opportunity for the government and the states to expand their utilization work with a more extensive, aggressive and definite program to educate the public to the situation and to make different classes of consumers see and feel their responsibilities.

THE RED DRAGON OF NEW JERSEY'S FORESTS

THERE are two million acres of forest land in New Jersey which, as transportation goes today, are almost within trucking distance of the greatest lumber market in the world. Sooner or later the people of the state will awaken to the economic significance of that fact, but unless they hasten their steps, the awakening may be too late. New Jersey's forests are being burned at the rate of 70,000 acres a year, all of which is tending to reduce the area of growing forests and to convert land which naturally would become a public asset of great value into a public liability of unsightly and embarrassing proportions.

No Lack of Forest Land

The state has never ranked as a great lumber producing state but this may be attributed to its size and and not to its lack of forests and forest lands. Approximately forty per cent of the land area of the state today is forest land and the soils and climate of New Jersey are such that timber grows rapidly wherever it is given a chance. But more than that, these good forest growing lands are about as close to great diversified markets as it is possible for wild land to be. Lumber prices in these markets are every year more and more being set by the cost of importing lumber from the extreme south and the far west. The raiser of timber in New Jersey has no $25 freight bill to pay on every thousand feet of lumber he manufactures, but in years to come his selling price will be based upon these long haul costs. He will reap the advantage and his state will be enriched.

Fire—The Red Dragon

The people of New Jersey need lumber the same as the people of New York, Pennsylvania or any other state. They are today economically dependent upon the forests of the south and the far west, while at their very doorsteps they have two million acres of excellent forest growing land which with proper fire protection will largely take care of the state's future timber needs. Already the state is paying a five million dollar bill annually on lumber imported from the south and the west. This bill is increasing year by year while the area of growing timber within the state grows smaller with every fire season, for fire is the Red Dragon of New Jersey's forests. The State Department of Conservation and Development is authority for the statement that,

> "Each year we cut timber worth about ten million dollars on the stump. Under present forest fire conditions this production will continually decrease toward zero and our freight bill will correspondingly increase. With fire protection we could, as we ought to, cut timber annually with a fifty million dollar market value at pre-war prices and not overcut in doing so, but do it year after year indefinitely."

Forest Values and Public Sentiment

If the citizens of New Jersey, or any other state for that matter, could foresee the values which will attach to timber crops in future years, the whole public attitude toward forest fire and forest perpetuation would change over night. Every good citizen stands for the upbuilding of his state. He wants to see it prosper. He wants to see it developed and enriched for the benefit of his children and his children's children. He wants to see it, as a commonwealth, seize its opportunities and go forward shoulder to shoulder with other states. And, above all, he wants to see it conducted in a business-like and fore-sighted way.

The Family Skeleton of the Commonwealth

The average citizen feels pride in the sight of richly producing farms, developed waterways, thriving industries within his state. But he never boasts of or calls attention to barren and burnt over forest lands. They are the family skeleton of the commonwealth. And yet it is within his power to clear the closet of those bones by merely demanding that the state spend enough money for fire protection to permit nature to grow timber on the lands chiefly valuable for timber production. The want of that sentiment in New Jersey is yearly adding black, barren acres to the New Jersey landscape. About one-third of the state's forest area now contains merchantable timber. The other two-thirds have been wrecked by fire.

More Money—Less Fire

The Department of Conservation and Development has long called attention to the need of more effective fire protection. The state is spending only about $35,000 for the purpose and while the department has rendered very distinguished service in reducing fire losses, the amount is only about one-half of the minimum required for effective fire protection. Both the legislature and the governor of the state recognize the need of more funds. A year ago, the former passed a bill, which was signed by the governor, providing for a material increase in the state's fire-fighting organization, but the appropriations committee failed to make the necessary money available.

A Penny Wise and Pound Foolish Policy

It is mighty poor statecraft which persists in burning up the state's growing crop of timber, knowing that by so doing the people will have to haul lumber three thousand miles from the west coast to make good the loss. That soon becomes a far heavier tax upon the public and the industries of the state than a few cents an acre spent in protecting growing timber right at home. It is a policy which in order to save a few pennies today, would pauperize the state for a hundred years to come. The husbanding of its forest resources on the other hand enriches the state and renders it independent as a home-building, wood-using commonwealth. The people of New Jersey will have an opportunity to express their sentiment at the primaries this fall. Surely, they will not stand longer for the "penny wise and pound foolish" policy.

THE EARLY USES OF THE YAUPON

By C. D. Mell

THOSE familiar with the use of the leaves of yerba mate (*Ilex paraguayensis*) will not be surprised to learn that a closely related species native to the United States possesses almost similar properties and uses. The leaves of the yaupon (*Ilex vomitoria*) were used more or less extensively as a substitute for tea in the pioneer days. While the tea prepared from this native plant rarely appeared on the table of fashionable society, the extent to which it formed a part and parcel of the daily food of the great majority of the people along the South Atlantic seaboard, seems to point to the existence of salubrious qualities in the leaves of yaupon when properly collected and prepared.

The plant yielding this once important product belongs to the holly family of plants. It is a shrub or low tree growing plentifully along the Atlantic coast from Virginia southward to Florida, and attaining its best development on the edges of sand dunes and fringing the swamps along the coast, where it is easily accessible. The leaves are quite small and dark glossy green; the flowers, which are white and conspicuous, are succeeded by numerous small bright red berries which persist on the bushes for several months.

The Indian tribes taught the early white settlers the use of the yaupon leaves for making a tea, which they called black drink, and which was said to enliven them. The white people soon became accustomed to it and many preferred it to the imported tea. A number of the early travellers and writers in America eulogized it and recommended it as a most agreeable beverage. The Creeks employed it at the opening of their solemn councils, sending regularly to the seaboard for supplies. They prepared a very strong tea and during certain periods of the year, they drank it to excess so as to cause vomiting, which they regarded necessary in order to purify their bodies.

The plant possesses emetic properties when taken in sufficient quantities, and has tonic and digestive qualities, free from the sleepless effects. Although the aroma is different from that of tea, it has stimulating properties depending upon the quantity used. According to recent chemical investigations the leaves contain caffein which is the same active principle found in coffee. They contain also another principle which is said to act as a powerful diuretic and which is employed in nephritic diseases, diabetis, gout and smallpox.

THE KUDZU VINE AND OTHER CLIMBERS

By Dr. R. W. Shufeldt, R. A. O. U.

Photographs by Dr. W. E. Safford, Mr. Freeman and the author

N the flora of any country, the number of vines represented is invariably far less than that of all other kinds of plants taken together, and this is the case with respect to our own flora here in the United States. Usually, only a few vines grow in the open country—such as the low vine blackberry, the bindweed, and dodder—as their opportunities to climb are limited. Along stone walls and rail fences the case is different, and there we will meet with a greater number; for in such places poison ivy, bitter-sweet, and many others flourish in abundance. However, there is no hard and fast rule in regard to this, as we frequently meet with vines growing in the most unexpected places.

There are not a few points of interest associated with the word *vine*. It bears a close relation to the word *wine;* and the Century Dictionary has it that a vine is "a climbing plant with a woody stem, the fruit of which is known as the grape, a grape-vine; often called specifically *the vine*" * * * "Any plant with a long stem that trails on the ground, or climbs and supports itself by winding round a fixed object, or by seizing any fixed thing in its tendrils or clasps; as the hop-vine; the *vines* of melons." In other words, we have wine made from the fruit of *the* vine, and through acetous fermentation of several inferior wines we obtain *vine*gar.

All through fabulous and romantic history, vines have often been introduced in one way or another—we read of immense vines that in some instances grew to astounding proportions in the course of a single night or day. Then there is the famous "Bean-stalk" that Jack climbed, in the old nursery tale, which many associate with the Kudzu vine, so often observed in southern cities and elsewhere. The latter vine is now seen growing in many places in Washington; yet but few people in that city seem to know anything at all about the plant or even its name.

ROOT OF THE KUDZU VINE

Fig. 1.—This large starchy root of the Kudzu Vine (*Pueraria thunbergii*) is an article of much economic importance in China and Japan.

A most wonderful example of the growth of the Kudzu vine is to be observed opposite the east entrance to the National Zoological Park, back of the little refreshment stand, where three plants have spread to such an extent that they have filled in the entire valley—an area of at least an acre and a quarter (Fig. 4); while in many other places in the city this luxuriant vine runs over high walls, buildings, and other structures. Again, west of my home on 18th Street, we have the boundary wall of the old Ingleside estate, and over this climbs an unusually fine plant of this species, which bears, towards early autumn, its beautiful racemes of purplish, papilionaceous flowers, exhibiting at the same time bunches of hirsute pods. Not long ago I photographed specimens of this particular plant, giving the leaves, flowers and pods (Fig. 2). Many of these vines in the city do not seem to bear flowers, and strike one as consisting of a great mass of leaves and nothing more. The leafage of the vine is often so dense that the stem of the vine is quite obscured by it as it runs over tall fences, up the sides of adjoining houses and chimneys in one dense, green mass. Sometimes the Kudzu vine will be found growing among much scattered trees, at the edge of some timberland, where, too, may flourish an undergrowth of sumach, elderberry, and other scrubs; and, if not obstructed in any direction, it is a sight worth seeing to observe its extraordinary spreading growth. In an incredibly short time it spreads a dense, leafy mat of several layers of leaves over all the shrubbery and open spaces, running up upon trees that have a height of 30 or 40 feet, and completely putting them out of sight. One may see an excellent example of this on the farther side of the long, straight road that bounds the National Zoological Park on its east side, in Washington. (Fig. 6.)

Dr. W. E. Safford, Economic Botanist of the Bureau of Plant Industry, United States Department of Agriculture, tells me that the botanical name of the Kudzu

FLOWERS OF KUDZU VINE

Fig. 2—These flowers bear a general resemblance to those of the locust tree. They are purplish in color. Note the seed pods and leaves. (Reduced one-half.)

vine is *Pueraria thunbergii;* and in his letter of September 1, 1920, he says that "It is of Oriental origin and its large, farinaceous roots are used by the Chinese and Japanese as a source of a starch or arrow-root of excellent quality, much used by invalids and for making sweetmeats. Although blooming freely in this country, it seldom forms perfect seeds or very large roots . The plant grows with such rapidity that it soon covers windmill towers, and has by some jocose botanists been identified as the magic beanstalk by means of which Jack climbed to the sky.

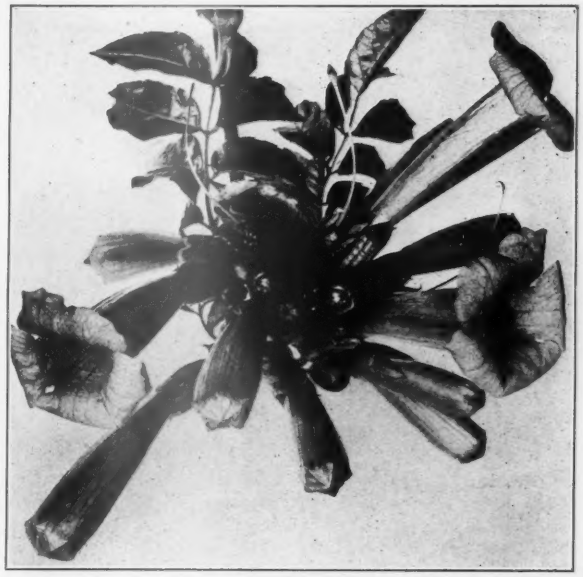
"I am sending you, under separate cover, a photograph of a root from China, which is at your disposition, and I should be very glad to receive a copy of your own photograph."

The elegant photograph of the root of the Kudzu vine sent me by Doctor Safford is here reproduced in Figure 1; it was taken by him and Freeman on November 7, 1919, at the United States Botanic Garden, the specimen being, as he says, a "large root from China." Later I sent Doctor Safford the photograph he desired, a duplicate of which is here reproduced in Figure 2, and he wrote me on the 26th of September, 1921, thanking me for my "beautiful picture of *Pueraria thunbergii,* which is absolutely perfect. I hope you will publish it and call attention to the economic value of its large starchy roots. Dr. Tanaka tells me that the starch derived from it is of great importance in Japan and China."

I am not informed as to whether the root of the Kudzu vine has been used for any purpose in this country; if not, the subject is worthy of investigation.

Taking the country at large, there is a very long list of vines in our flora, and not a few of them have interesting life-histories. We have also many introduced vines, while the list of cultivated species is surely a long one.

Vines in nature fulfill many purposes in addition to the ends met by wild plants in general, while we cultivate others to meet various ends—economic, æsthetic, practical, and otherwise. Some of the species are small, delicate in structure, with small flowers; and, unless growing in masses, they might never attract the attention of the casual rambler in woods and fields, while others may grow to become giants of their kind. They may have rough, bark-covered trunks as big as an average tree; while, spreading far and wide, they dominate all and cover all that they, in time, overspread. Some of this class may possess wonderful flowers in the season of their florescence; and I remember a pas-



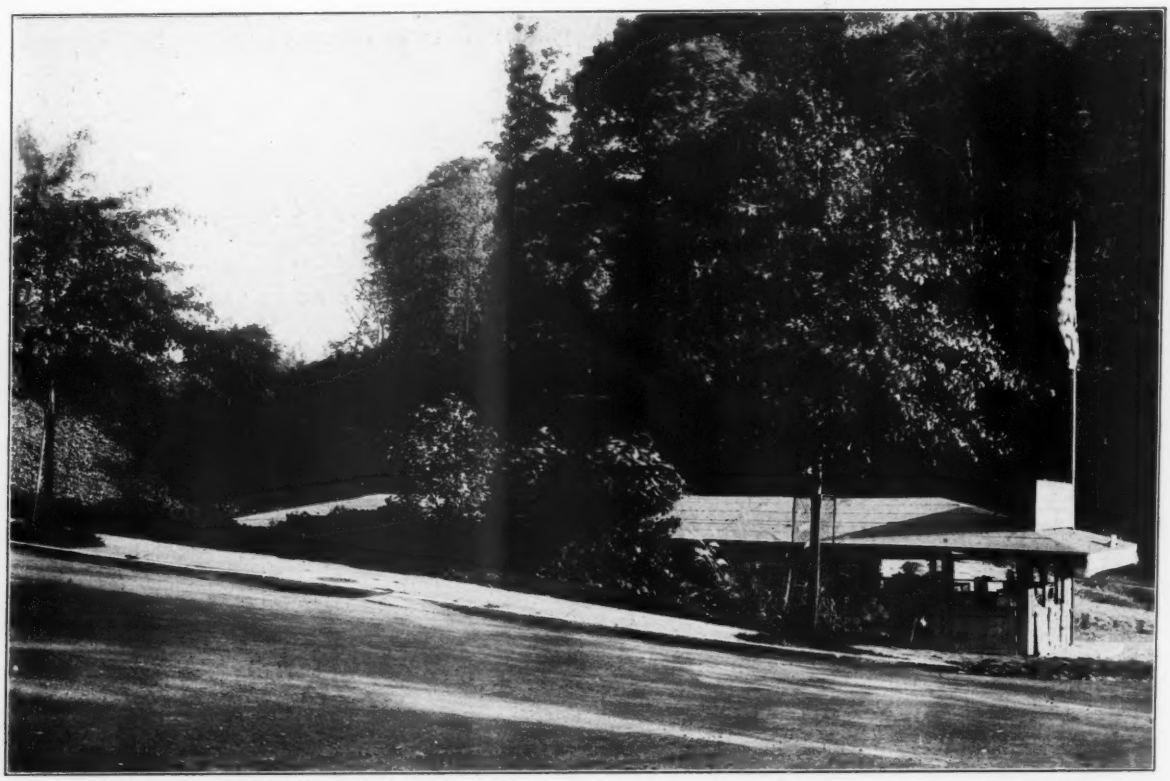
TRUMPET FLOWERS

Fig. 3—Trumpet-creeper is another name for this well-known climber, a conspicuous vine of the southern states, where it blooms in August and September. Photograph by the author.

sion-flower vine that grew on our place in Havana, Cuba, that held the attention of nearly every one who passed that way. It grew all over a tall fence between our home and that of our next door neighbor, running up so high as to cover the side of a big building nearby, and actually putting out of sight much else besides. Its flowers, as big as those of our tulip-tree, were wonderful to behold, the parts of one of them being likened, by people of that country, to three nails, a cross, and so on. But rich and handsome as passion-flowers are,

they are West Antillean and not found in our flora; so they do not appeal to us in the way that some of our own vines do—as, for instance, that grand aerial climber, the trumpet-vine or trumpet-creeper of the South (Fig. 3). This splendid vine has long been introduced into the North, where it is much in demand to run up over porches, arbor-screens, and similar structures of the home. The flowers are of brilliant orange and scarlet, so that a bunch of them may be recognized at quite a distance, especially when the bunches, as is usually the case, hang in front of the dark leaves of the vine, which latter are pointed, toothed, and of ovate outline. As their cars. Dogwood and many other lovely wild flowers suffer in a similar way.

There is a great number of fairly well-known vines growing wild in the eastern part of this country besides the few already mentioned; among them we may name the poison ivy, the Virginia creeper, the wild morning glory or bindweed, the curious leather-vine, the deadly nightshade, dodder, clematis, honeysuckle, and others. Then, under cultivation we find the hop-vine, clematis, coral honeysuckle, various peas and beans, moon-vine, rambling roses, gourds of different species and many garden vines, as pumpkin, squash and cucumber. In-



WHAT A FEW KUDZU VINES CAN ACCOMPLISH

Fig. 4—Three Kudzu vines covering an area of about an acre and a quarter. This vine is about three years old, and started from only three roots planted in the rear of the building. Note how it has run over the latter and over the trees to the left in the picture. Photograph by the author.

will be noted from the figure, the flowers are funnel-shaped, reminding one of little red trumpets—hence their name. The aerial rootlets by means of which this vine climbs, hold on with great tenacity to whatever they take to; while the flowers, when fully open, readily fall off their stems, rendering them unsatisfactory to carry home and use for photographic purposes. (Fig. 3.) As a rule, automobilists are ignorant of this fact, and the consequence is that many a bunch of trumpet flowers are to be seen lying by the wayside in midsummer, having been picked by these people for no other reason than temporary gratification, and to attract the attention of other automobilists as they shoot past each other in deed, taking the combined list, the species would run up into the hundreds. Not a few of those now regularly cultivated are also found growing wild, as Virginia creeper and trumpet-vine; while, as we may readily surmise, all of the cultivated species have been derived from those still found wild in the flora of one country or another—either here or in the Old World.

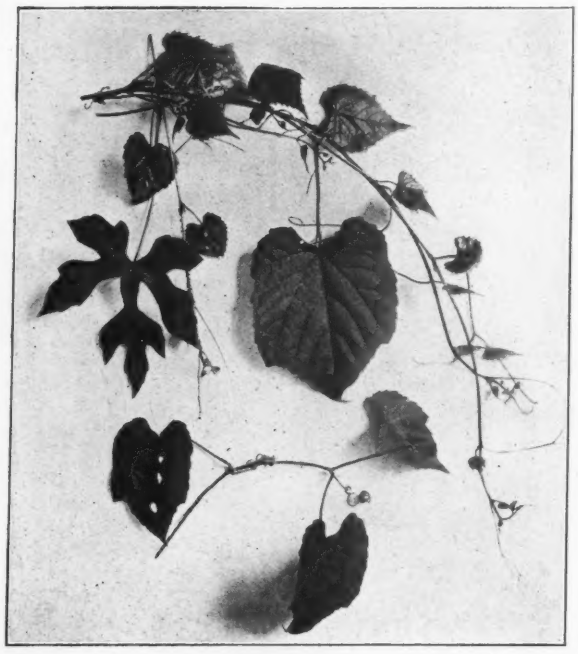
As vines and creepers were bred from wild ones and passed through various stages of cultivation, such as modification of form and flower and other matters, the cultivator ever had it in mind to improve the plant to meet the end he had in view. For instance, the hop-vine was cultivated in such a way as to yield more and

Upper—THREE YEARS' GROWTH FROM THREE ROOTS OF THE KUDZU VINE

Fig. 5—This is an extraordinary example, spreading over the great hollow to the eastward of the refreshment booth just outside the "Zoo" gate (Washington, D. C.). Photograph by the author, summer of 1920.

Lower—A PART OF A KUDZU VINE OVERLYING UNDERGROWTH AND TREES

Fig. 6—About 200 feet of a vine growing on the farther side of the automobile road bounding the National Zoological Park at Washington, D. C., on the east. Note how it has run over all the shrubbery and the tall trees to the right.



LEAVES OF THE WILD GRAPE-VINE

Fig. 7—All the parts here shown are from the same vine, and the variations are apparent. Note the black aphids on the shoot partly hidden by the incised leaf to the left. Collected and photographed by the author. Much reduced.

better hops; the garden vines, as peas, beans and many others, to produce vegetables of greater size and richer in food qualities; for shade, bigger leaves, and power to extend over greater surfaces; for beautiful and curious flowers; to enhance the characters for medicinal products, to insure greater quantities and strength; for products used in the arts and industries, various improvements in them, and so on.

There are various means inherent in any particular vine or climber that ensures its being able to climb or to creep. This may be done by sheer extension of growth, the plant simply rambling over anything and everything that chances to be in its way as it grows. In others, as in tear-thumb, the four-angled, reclining stems beset with fine, sharp prickles (at the angles only), admits of its stems hanging onto, more or less tenaciously, any ordinary thing it comes in contact with as it extends through growth.

Some plants, as in the strawberry group, possess *runners* from which other plants are produced; but these runners must not be confused with such structures as allow other plants to creep or climb; the function in either case is entirely different.

It is a well-known fact that many plants climb by tendrils—curious little twisted affairs developed on the stems and on other parts of the plant. These vary greatly in form and structure. Some are extremely delicate and weak; others are wiry and very strong, as in the grape-vine series; some develop little terminal suckers, which, sticking onto anything in the vine's line of growth, hold on with remarkable tenacity.

In plants of the cow-vetch order, the paired tendrils are found at the terminus of any of the leaf-stalks; they are fine and hair-like, but allow of the plant being a most successful climber. Our common ground-nut is an excellent example of a species that climbs to a height of several feet with no developed structure to assist it. Wild beans and hog peanuts are in the same case and we find an equally good example in our bitter-sweet, a climbing vine of great beauty, often seen running over stone walls or old wooden rail fences. In the woods it may sometimes take to a tree, climbing to a height of some fifteen or twenty feet or more. In these efforts its stem becomes much twisted, causing its exquisite fruit or flowers to assume regular positions with respect to the stem—a fact still more apparent in the pale green ovate leaves which come out alternately or in ranks, as it were, as the vine twists about its support.

The peculiarities of wild grape vines have already been alluded to elsewhere, while an additional character will be mentioned here, one that must not be overlooked,

BUNCH OF UNRIPE WILD GRAPES

Fig. 8—This specimen is from a vine growing in the woods near Washington, D. C. Collected and photographed by the author. Slightly reduced.

namely the great variations to be seen in the outline of the leaves found upon the same vine at the same time; these are well shown in Figure 7. Some grape-vines possess truly woody tendrils that are, when fully matured, as strong as medium heavy wire, and twist about what they take hold of in the closest and most efficient manner. Other vines possess similar structures.

Our Virginia creeper, already mentioned, is a vine that possesses not only disc-bearing tendrils but aerial rootlets as well, which doubles its means of climbing over extensive surfaces. One of these vines now flourishing on the south pebble-dashed wall of my home here in Washington has almost entirely covered that part of the house, which is three stories high; it is still growing,

A JAPANESE MORNING GLORY OF GREAT BEAUTY

Fig. 9—The flowers of this vine are of a deep purple, emarginated with white. Photograph natural size, by the author. Note the curious little beetle on the central leaf.

THE WILD HONEYSUCKLE

Fig. 10—One of the most delicate and fragrant of all our wild flowers. It often grows in great masses, its yellow-veined leaves being wonderfully striking. Photograph by the author.

and bids fair to run up on the roof and cover the chimneys soon. When in flower, or when bearing its lovely bunches of dark purple berries upon scarlet stems in the autumn, there being hundreds of them, and with its green or scarlet leaves, depending upon the time of the year, it is truly a beautiful sight. Our English starlings are extremely fond of the berries, and as many as a dozen of these birds sometimes flock to this big climber to feed upon them.

Plants of the moss-pink and trailing arbutus order are great favorites; they are mere creepers—crawlers, really—that possess no claim entitling them to rank among the true vines or climbers.

Every lover of flowers knows the wonderfully attractive clematis, referred to by Schuyler Mathews as a "most beautiful trailing vine, commonly found draped over the bushes in copses and by moist roadsides. The leaves are dark green, veiny, with three coarsely toothed leaflets; the flat clusters of small flowers with four greenish white sepals and no petals, polygamously staminate and pistillate on different plants; cross-fertilized by bees." Further along he adds: "In October the flowers are succeeded by the gray plumy clusters of withered styles (still adherent to the seed-vessels), which appear under the glass like many tiny twisted tails. The plants presenting this hoary appearance gave rise to the popular name Old Man's Beard. The vine supports itself by a twist in the leaf-stem, the latter revolving a number of times in the course of growth." This plant may be seen in many of our southern cities, a single specimen growing to a length of a dozen feet or more. Another name for the clematis is Virgin's Bower, and we also have a species known as the Purple Clematis.

Most of us are familiar with the little trailing vine of the woods known as the partridge-berry or twinberry. Its dark green, evergreen leaves, veined with greenish white, are small and oval in shape. In the autumn its bright red or scarlet berries, growing in pairs, attract the attention of any one passing the place where it grows which is often in the deepest shadows of the forest, and this renders them all the more conspicuous.

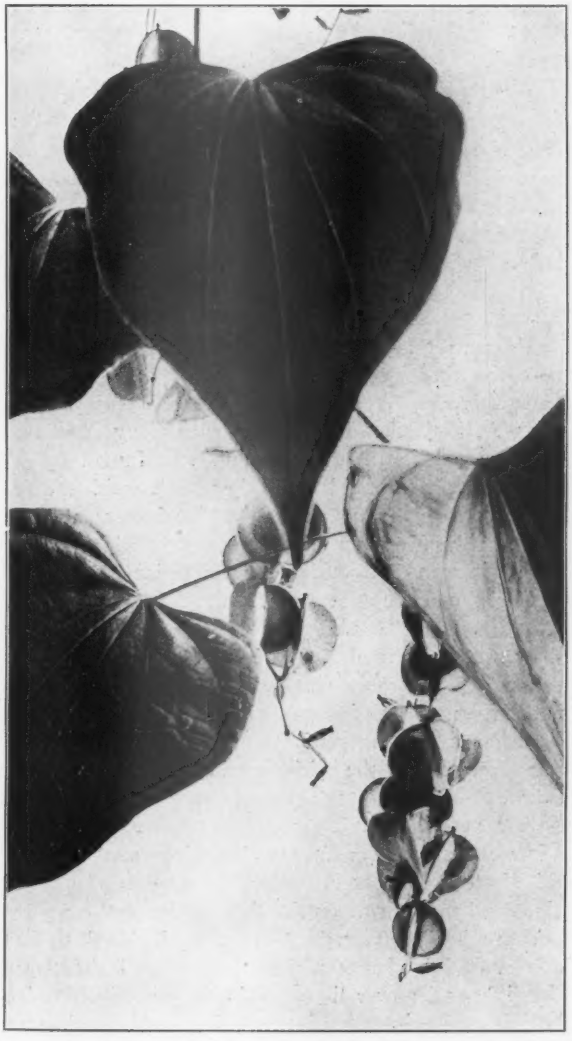
Two more familiar plants are seen in the trailing bindweed and the common dodder, the first-named being related to that grand group of wonderful cultivated

FLOWERS AND LEAVES OF THE WILD YAM

Fig. 11—The roots of this well-known vine are used in pharmacy, and the plant is readily recognized by its rather pale and very beautiful heart-shaped leaves, which are conspicuously veined. Photograph by the author.

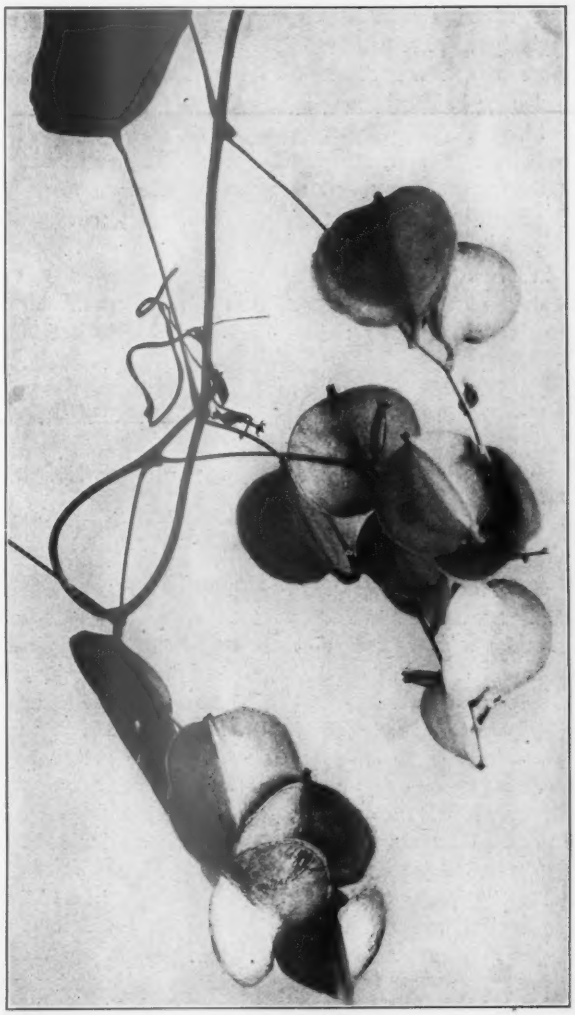
climbers well known as morning glories, of which is here presented a beautiful photograph of a species introduced from Japan (Fig. 9). There is an almost endless variety to the flowers of this familiar climber, and they run all the way from pure white to a rich, deep purple, or some of the crimsons and deep blues. The flowers of the wild trailing bindweed, however, are pure white, though they may be pink-tinged sometimes. In open meadows, over old fences along the roadside, and sometimes in the woods, this vine climbs over everything in its way; and when it bears many flowers, it is by no means an unattractive plant. There are several species of it in the family to which it belongs, as the Upright Bindweed, the Hedge Bindweed, the White, the Trailing, the Small, and perhaps others.

Mathews speaks of the common dodder as "a miserable parasite often troublesome in gardens, but found in low, damp, shady situations. It climbs high upon other plants by twining closely about their stalks and exhausting their juices through a thousand tiny suckers. Its thread-like, twisting stem varies in color from dull yellow to dull orange, it is crowded with bunches of tiny dull white bell-shaped flowers having five lobes. The calyx is greenish white. All the dodders start at first from the ground, but finally securing a convenient plant upon which to climb, the root in the earth dies and they become parasite."



LEAVES AND SEEDS OF THE WILD YAM

Fig. 12—These seed pods, of a very pale tan color, are notably conspicuous objects in the woods where the vine grows. Photograph by the author, reduced.



SEED PODS OF THE WILD YAM

Fig. 13—Note that the tendrils of the plant are not very abundant, nor of marked clinging capacity. Often the small, greenish-yellow flowers are present with the 3-valved seed capsules, as is the case in the cut.

A few years ago I ran across a mass of these plants along the old Georgetown Canal, at Washington. None of them had any hold upon the ground, while their murderous, twisting stems were everywhere twined about the upright stalks of a big group of artichokes, then in full flower. Some of these latter already exhibited the effects of the juice-sucking plants that were clinging to them, and all were probably doomed to perish as vic-

tims of this thief of the Convolvolus family, which everybody abhors, although the plant is doing nothing more than it was created to do, and what its ancestors had done before it, long ages ago.

Many elegant vines are known as gourds, and they constitute a separate family, our common Climbing Wild Cucumber being an American example of them. It possesses fine, curling tendrils and leaves that remind one of those of the ivy. The ivies, by the way, are still other vines with most interesting histories; and the facts that make up their natural history and characters have been woven into prose and poetry since the days of yore. We have:

"Oh, a dainty plant is the ivy green
That creepeth o'er the ruins old!
Of right choice food are his meals I ween,
In his cell so lone and cold."

and the rest; and it was Gray who left the lines:

"From yonder ivy-mantled tower
The moping Owl doth to the Moon complain."

We have a great many more vines that might be described or at least referred to here; but their histories must be reserved for some other time.

FOREST FIRES WORST IN SIX YEARS

ALTHOUGH the forest fire situation in the Northern Rocky Mountains and North Pacific Coast region is far worse than it has been for six years, there is little general appreciation of the fact throughout the country, reports the National Lumber Manufacturers' Association. So many hundreds of fires have there been and so many brief reports of them that they have come to be accepted as part of the routine of daily life, just as bloody battles were during the World War. It requires a survey of the voluminous reports collected by the Association at its offices at Washington to get an adequate impression of the damage that has been done and the extent of the menace that existed, and to some degree, still exists. It is calculated that the losses have aggregated about $5,000,000.

Possibly the greatest actual damage to virgin standing timber has been outside the boundaries of the United States and on the Canadian side, in the Pacific Coast region. One fire in British Columbia destroyed sixty million feet of the finest timber. So numerous have been the fires in that province that the Lieutenant-Governor of British Columbia ordered the cessation of logging operations on Vancouver Island in order to release the employes for fire-fighting.

While there has been no such single case of damage on the American side, the fires have been even more numerous and have covered a larger area, including much of the timber region of eastern and western Washington, Oregon, Idaho and Montana. One hundred and fifty thousand acres have been burned over in Washington, and the property loss in Idaho is placed at $1,500,000. Some virgin forest and tens of thousands of acres of cut-over lands have been burned and large quantities of second-growth timber have been destroyed, as well as great quantities of logs, many camps and much equipment. While cut-over fire damage does not measure into relatively large sums in terms of present value, it must be remembered that destructive fires on the cut-over lands mean loss of mature timber for the next generation and, sometimes, destruction of the soil. One calculation has it that actual or potential timber sufficient for 300,000 homes has been burned in the last ninety days.

The season has been exceptionally dry throughout the Pacific Northwest, with the result that fires are very easily started. In one instance a spark from a donkey engine used in logging operations, started a fire which covered 20,000 acres of land, destroyed 15,000,000 feet of saw timber, four logging camps, fifteen donkey engines, one locomotive, 35 flat cars, 20 houses and three automobiles. Occasional small showers have sometimes aggravated the situation because of the accompanying lightning and resulting new fires.

From almost every small section of the Northwestern timber belt come tales of fire after fire and endless accounts of the struggles of forest rangers and patrols, loggers, sawmill employes and citizens in general, exerting themselves to exhaustion to check the flames. Here are a few recent reports taken at random :

At Newport, Washington, there were two separate fires. At Potlatch, Idaho, a great fire along Floodwood Creek spread for many days and was fought by 500 men. One phase of this and other battles with the fires in northern Idaho was that the fire-fighters went on strike. Two fires east of St. Maries in Idaho, burned over 5000 acres, menaced great white pine holdings and required the heroic efforts of 300 fire-fighters to check it.

In the Blue River country of the Cascades in Oregon, a fire threatened some of the finest timber in that section and was only checked after a desperate effort by a large number of men. There were numerous fires in various other parts of Oregon; one of them for a time threatening the rich, agricultural Hood River Valley. Many fires were reported in Columbia and Tillamook counties.

In western Cowlitz County, Washington, the Eastern and Western Lumber Company had to suspend all operations and concentrate on fire fighting for many days.

A fire in the Cascade Mountains, believed to have been started by berry pickers, endangered the Seattle City light and power lines. A bridge was destroyed on the Eatonville Branch of the Chicago, Milwaukee and St. Paul Railway. There were many fires in the Snoqualmie National Forest, but the worst of them was brought under control after it had burned over 300 acres. A fire west of Darrington blackened 25,000 acres.

The fire in the Marble Creek district in Idaho, spread to 15,000 acres before it was checked. At Marcus, Washington, two days of continuous fire-fighting exhausted the fighters and they had to give up the struggle.

The timber on the Bull Run water reserve and Portland, Oregon, water supply system, was only checked after 160 men had labored to the point of exhaustion. There was no rainfall in the Portland district for a whole month and very little rain in the preceding month.

The United States War Department came to the rescue in Oregon by detailing a number of army flyers to patrol the forests and watch the fires.

Fires in the Chelan National Forest on the east side of the Cascades in Washington inflicted extensive damage.

Literally hundreds of similar reports might be quoted from the Northwest. While at present no serious fires are reported in the Lake states or in the Northeast, fires earlier in the season destroyed one million dollars worth of timber in Pennsylvania alone.

When the great number of different fires is considered it is not surprising that statistics show that the area of forest land annually burned over is about twice that cleared by the ax for lumber and other purposes.

United States foresters. lumbermen and timber owners agree that the present costly experiences demonstrate that the primary step in solving the problem of the supply of forest products in the future, is adequate protection of the remaining stands of virgin timber and the cut-over lands on which nature is attending to reforesting. It is hoped by all of them that the disasters of this season will lead to early action by Congress and state legislatures, looking to vastly improved provisions and arrangements for preventing and suppressing forest fires. It is pointed out that there is small chance for natural reforesting to succeed and no encouragement for afforestation when the probabilities are that fires will sooner or later undo the work of both nature and man.

"When winds go organing through the pines,
On hill and headland, darkly gleaming,
Meseems I hear sonorous lines
Of Iliads that the woods are dreaming."

—Madison Cawein.

DO not rob or mar a tree unless you really need what it has to give you. Let it stand and grow in virgin majesty, ungirdled and unscarred, while the trunk becomes a firm pillar of the forest temple and the branches spread abroad a refuge of bright green leaves for the birds of the air—*Henry Van Dyke.*

A HOT TIP

By John Lewis

In Northern Minnesota, just a month before the date
When the Hohenzollern Kaiser got the celebrated 'gate'—
While each railway
Was being cared for tenderly by McAdoo and Hines
Some engines using red-hot coal dropped sparks along the lines,
In their frail way.

Said Quincy Adams Jefferson, a settler on the land:
"To burn a bit of brush round here would help to beat the band
With my clearing."
And likewise on that selfsame day a farmer, Angvik Mork,
Said: "Tenk, by yee, a leetle fire vill save me plenty vork,"
(Never fearing);

And Victor Hokkonen and Como Muzzio
And Heinie Pflugendorfer got the notion,
And Mike Podopoulos and Vladimir Czecho
And Sandy Inverary and Joe Rochon.

Thus, scattered all about, it shortly came to pass
That scores of hand-made fires started glowing;
And doubtless sev'ral more were kindled in the grass
By locomotives careless in their going.

It was, of course, unfortunate, but rain had not been seen
Around these parts for seven weeks; and that could only mean
They lit tinder.
So, when a gale roared from the West, the obvious befell,
For Northern Minnesita looked a proper piece of—well,
Call it cinder.

And nobody will ever know how many lives were cost—
Since flu attacked the homeless ones, that reckoning is lost.
Circumspectly,
I'll place the dead by smoke and flame at nigh four hundred souls,
While full two thousand more were left in casualty roles.
(Please correct me).

The lawyers had a hunch. They played it pretty fast
And, swiftly signing settlers up for vengeance,
Made Government the goat and lashed it to the mast
For operating spark-ejecting engines.

So Government must hand, in squaring for its crime,
Some twenty-seven millions to the claimants,
(Whose lawyers get one-fifth, to compensate for time).....
Now, none will grudge his taxes for the payments,

But—lest you think I only plead 'gainst Federal control
Of railroads, which has eased us of this tidy little roll—
My contention
Is that countless folks have land to clear, so there'll be fires again
Unless the Forest Service gets the necessary yen
For prevention;

And twenty-seven millions would have worked for many years
Protecting life and property and saving bitter tears
Through the nation.
So any legislature (in any timbered state)
Which cramps the style of 'Forestry' deserves, for final fate,
Just cremation!

THE LAND OF THE CHEROKEES

By Ovid M. Butler

Forester, American Forestry Association

AN expedition, unique in the history of American forestry, left Atlanta, Georgia, on the morning of May 29, 1922, and moved swiftly northward in the direction of the Blue Ridge Mountains. It was a caravan, not of canvas-covered, mule-drawn wagons with bearded drivers, but of glistening, high-powered automobiles bearing a party of more than half a hundred white collared men, bent upon seeing with their own eyes what manner of country Ernest Neal had in mind when he wrote:

"Have you heard of the land of the Cherokees,
With its wonderful streams and beautiful trees?
Of its flowers abloom and the wild perfume,
That floats like a bloom on the evening breeze?"

The expedition had been organized by the Atlanta Constitution, one of the leading Southern newspapers, with the object of unfolding the vast possibilities of the Cherokee and Natahala National Forests in north Georgia as summer recreational areas for the people of Georgia and the nation. Among the party were Congressman Gordon Lee and Thomas Bell, Thos. H. McDonald, Chief of the United States Bureau of Public Roads, James A. Holloman, Washington correspondent of the Constitution, Col. F. C. Boggs and Col. G. C. Howell, of the War Department, F. W. Reed, District Forester, United States Forest Service, W. R. Neal, Georgia State Highway Engineer, and other representatives of federal and state departments. In addition, there were representatives of the public, a number of foresters who knew the country, a car of boy scouts, a radio unit, moving picture operators and a fully equipped repair truck.

Leaving Atlanta at seven o'clock in the morning, under clear skies and on dry roads, the party was soon in the beautiful historical village of Roswell, where it made a brief stop to visit the charming old colonial home of Martha Bullock, set upon a hill among the cedars and the crowding hardwoods. It was here that the mother of former President Roosevelt was born. Continuing northward, the expedition sped on through rolling country, the road flanked by cotton fields, some long ago abandoned and now covered by dense young forests of pine.

Through the villages and the countryside and into the log cabins of the mountaineers for back in the hills, the news of the coming of the party, which would "tell the world" about the beauty and possibilities of the forests of north Georgia, seemed to have swept in advance. At every town and village the populace was assembled on the main squares. Schools were adjourned and healthy, bright-eyed children, intense expectation written on their tanned faces, hung over the fences along the road and waved their greetings; or gathered at the town square with flags and sang "America."

It was necessary to stop at all these villages to partake of the receptions extended. There were brief speeches of welcome and refreshments were invariably served. At Cummings, long tables covered with snow-white table cloths, had been set under the trees of the Court House yard. These the women of the town had bountifully loaded with ice-cream, lemonade and a variety of delicious cakes which threatened for a time seriously to delay the expedition. At the home of a Southern planter, whose acres stretched for miles in every direction, the party was stopped and served buttermilk and ginger bread while a band played behind the tall columns of his spacious

EVENING OF THE FIRST DAY BROUGHT THE FOREST TRAVELERS THROUGH A COUNTRY RICH IN BEAUTY, INTO THE SHADOW OF YONAH MOUNTAIN

porch. At the little town of Cleveland, the exploring tourists were ushered into the drug store and billiard hall where a spread of soda pop, peanuts, cigars and bananas awaited them.

Such was the nature of the hospitality accorded the party as it moved up through the foothills toward the undulating skyline of the Blue Ridge, bathed in a soft haze of restful colors. By evening of the first day, the forest travelers drew up in the shadow of Yonah Mountain, the trysting place of the beautiful Indian maid, Nacoochee, and young Laceola, son of a hostile chieftain. The good roads of the lower foothills and the stretches of rolling and terraced fields had been left behind. Instead, the route more and more wound in and out, up and down, across bridgeless creeks and over ungraded and often washed out roads, into the steep and wooded hills of the Cherokees. But the sky was clear and the increasing jolts and discomforts of the road were absorbed by the beauty and restfulness of a perfect evening amid mountains which seemed the untarnished heritage of gentle spirits of ages long ago before there were noisy, crowded cities filled with greed, hypocracy, heart - aches and jaded souls.

THIS POINT ON YONAH MOUNTAIN MIGHT WELL HAVE BEEN THE TRYSTING PLACE OF THE INDIAN MAID, NACOOCHE, AND HER LOVER, LACEOLA

After spending the night in Nachoochee Valley, just outside the purchase area of the Cherokee National Forest, the expedition swung eastward, crossing the beautiful Chattahoochee River just above Tullulah Falls. It then turned northward and began the ascent of the Tallulah mountains. The weather was still clear and although the road was very rough with many hairpin curves and hazardous pitches, progress was seriously impeded at but one point where several machines balked on swimming a swift running mountain stream. All along the way, young forests crowded the road, seemingly cutting it off here and turning it in there, much like a crowd of boys driving a skittish calf. Blooming laurel and rhododendron brightened the dense shade of the hardwoods while in the valleys and ravines where the mountaineers have built their log cabins and cleared small patches of ground, thin columns of blue smoke drifting lazily upward, stood out against the green mountain sides.

As darkness fell on the evening of this second day, the caravan of automobiles, their radiators steaming hot, crested the divide and stopped for the night at the hamlet and summer resort of Highlands, North Carolina, almost 4,000 feet above the sea. Coming up the mountain, every turn of the road around a projecting shoulder threw into relief a mountain view of impressive beauty and the spell of the Blue Ridge was therefore aglow in the breasts of the travelers as they retired for the night after a supper of fried chicken and hot biscuits at the village inn.

But on the following morning the skies were dark with low hanging clouds and a steady rain was falling. The day's plan was to go to Franklin the headquarters of the Natahala National Forest. The first lap was one of eighteen miles down the mountain to Dillard. Those eighteen miles proved almost the undoing of the expedition. The road at best is a bad one, but soaked with rain, it was almost impassable. First one car and then another settled in the yellow mud until its body rested upon the ground, defying the efforts of the car in front to pull it out or of the one behind to push it through. A mountaineer with a team of diminutive mules, who chanced to overtake the caravan saved the day. Seven hours were re-

quired to cover the eighteen miles to Dillard and it was a wet, mud covered and starving band which sought food at the country store there at four o'clock in the afternoon.

Before nightfall seven more miles were made and the night was spent at Clayton. Rain had fallen throughout the day. Stories of impassable roads in the direction of Franklin necessitated the elimination of that part of the tour, so on the following morning, with the mountains still being drenched with rain, the expedition turned westward and cruised slowly and cautiously along the rough and watery road which coiled up Tullulah river, over the mountain and down Hightower Creek, whose waters flow into the Mississippi river, to the beautiful little mountain valley and settlement of Hiawassee. Then onward through the rain, the machines camouflaged with yellow mud and resembling huge beetles emerging from a cataclysm, chugged and strained and bumped their way up another mountain road, through Brasstown Gap and into another charming valled which the waters flowing down from Brasstown mountain, lost now in low-hung, drifting clouds, seemed to have fashioned out as a special haven of rest and peace for men sick of the maddening crowds.

Passing through a low gap to the west, an hour's ride down Butternut Creek brought the expedition to the town of Blairsville, set in a mountain valley no less enchanting than those which the party had regretfully left behind. Except for rare moments when the sun sought to break through the low clouds, a fine rain had fallen throughout the day and had made the proposed trip to the top of Blood Mountain out of the question. Consequently the next day, with rain still falling, witnessed the demobilization of the party. A small party attempted a side trip into the Blood Mountain country but the remainder of the expedition still harassed by rain and mud and swollen streams, filtered out over the Blue Ridge divide through Tesnatee Gap and thence down through the foothills and back to Atlanta.

The trip out through Tesnatee Gap, however, revealed some of the most attractive mountain country encountered during the tour—a country cut by many ravines, heavily wooded with a virgin forest and watered by innumerable mountain streams with frequent waterfalls. The road was arched with the branches of great hardwoods and its winding in and out among their trunks seemed to breathe the spirit of an old Cherokee trail.

Despite the fact that the full beauty and charm of this section of the Blue Ridge mountains could not be realized because of unfavorable weather, the members of the expedition were without exception, won over to it heart and soul. For the land of the Cherokees is a land of gentle mountains, softened by an almost continuous cover of forest growth. It abounds in mountain streams, inviting camp sites, rest inspiring little valleys. It lacks the harsh and over-powering ruggedness which so often characterizes the Rocky Mountains and inspires in many a feeling of unfriendliness. It is a land sparsely peopled by a kindly and hospitable people who live a simple life out-of-doors, and whose blood, it is said, still flows one hundred per cent Anglo-Saxon. Its possibilities as a summer playground for the south and the east are unlimited and the value of its potential and applied water power will run into many figures.

DIGGING OUT WAS A COMMON EXPERIENCE ON THESE FOREST ROADS THROUGH THE BLUE RIDGE MOUNTAINS OF GEORGIA AFTER THE PARTY ENCOUNTERED THE HEAVY RAINS

And first and last, it is a forest country. A relatively small portion of its total land area will ever be devoted to agriculture. The remainder is chiefly valuable for forests, the natural richness and variety of which stand as the source of all its charm and wealth. The mountains and valleys are densely wooded with a luxuriant growth of hardwoods, interspersed with the sombre green of pine, spruce and hemlock. Almost every species of forest tree native to the eastern United States seems to be striving to claim these mountains for itself. Nature is enacting here a warfare among the trees not unlike that of the Indian tribes of years ago. Trailing the Appalachian Mountains southward from Canada, the spruce is making its southern stand on the highest mountains of the Blue Ridge while on the slopes and in the coves the beech, birch, sugar maple, hemlock and white pine of the northern forests are battling for possession with the southern horde of hardwoods, including the oaks, poplars, hickories, gums, maples and magnolias.

A STRETCH OF GOOD MOUNTAIN ROAD BUILT BY THE GOVERNMENT. NATHALA NATIONAL FOREST

But luxuriant as is the forest growth, these forests are not in the best of condition because so much of the region has been violently lumbered and burned by recurrent fires. The area of original virgin forests remaining is small and while the cut-over lands today are dense and green with young timber, much of it is being reclaimed by inferior species. But some of these species, while called inferior at the present time, may in years to come acquire, like the once despised gum, high commercial value. Nevertheless this second growth timber and particularly the forest growing power of this mountain soil, represent a great potential wealth for the region. All that seems necessary to keep these mountains dense with timber is fire protection, regulation of grazing after cutting and an ever-conscious appreciation of the fact that the forest growth is the source from which all its wonderful possibilities take life and permanence.

For none can deny that the secret of the bounty and beauty of this land, rich in Cherokee lore, is its forests. With them gone, its beauty and charm will be gone. Its recreational possibilities will vanish like sunshine before the storm. Its waterpower will have been scuttled and its soil will erode and wash until it will become a no man's land of gullied hills and flood infested valleys. Today, it is a remote country abounding in nature's riches and laden with man's redeemable possibilities. Almost in the center of the greatest civilization in the world and surrounded by millions of people, this land of the Cherokees, so serenely pleasing, so full of the things that are clean and big and inspiring in life, is for all practical purposes, in another world.

It needs the magic touch of good roads to lift the curtain and reveal the splendor and beauty of its proximity. It needs a conscious awakening to the value of its forest-growing power and the meaning of timbered mountainsides and wooded coves in the building of promised lands. As a scenic area for automobile touring, it would, with good roads, be unsurpassable but back of its recreational, water-power and agricultural opportunities, stand its forests, the source and shelter of all and a wealth producing opportunity unexcelled by all others combined. The land of the Cherokees needs a vision. It needs to have ever before it the vision of a country, moulded in God's crucible as it has been moulded, but with well cared for and productive forests; happy and thriving communities supported by the wood using trades; dotting farms and orchards resplendant with prosperity because of the markets and employment furnished by the forest industries; developed water power operating its wood using factories and lighting its mountain homes; telephones ringing in the mountain cabins; hard surfaced roads built with the aid of forest revenue; automobiles bringing the message of common progress and prosperity from north and south, east and west; and finally modern schools where the unusual intelligence of these mountain children can be developed to the fullest.

MAN-CAUSED FOREST FIRES ARE PREVENTABLE--
DO YOUR PART

THE BEECHES

By Joseph S. Illick

THERE are only five different kinds of beech in the world. Three of them are native to Asia, one to Europe, and one to North America. They belong to the beech family, which also includes the Chestnuts, the Oaks, and a few other tree groups.

The beech family contains some of the most important timber trees of North America and has representatives in nearly all parts of the world. About 600 different kinds of trees and shrubs belong to it. Of this large number 60 are native to North America and usually are classified in the following five groups:

	COMMON NAME	SCIENTIFIC NAME
1.	The Beeches	Fagus.
2.	The Chestnuts.	Castanea.
3.	The Oaks	Quercus.
4.	The Tan-bark Oaks.	Pasania.
5.	The Western Chinquapins.	Castanopsis.

The distribution of the Beeches is restricted to the Northern Hemisphere, where they form some of the most attractive and valuable natural and cultural forests known to man. Only two of the five species found in the world are of commercial importance. One of these is the European Beech. It is one of the most important forest trees of continental Europe. Its scientific name is Fagus sylvatica. It is rather widely distributed in Europe. Pure stands of it are common in Belgium, Denmark, Germany, and parts of Switzerland. It is also found in northern France, where thousands of acres were destroyed by the contending armies during the recent World War.

BEECH IS THE FOREMOST FUEL WOOD OF EUROPE. PEASANTS EAGERLY COLLECT EVEN THE TWIGS AND CARRY THEM HOME IN BUNDLES FOR GENERAL FUEL PURPOSES

The European Beech makes up about 70 or 75 per cent of the forest stand in the famous town forest of Sihlwald, which belongs to the city of Zurich, Switzerland. As early as 1422 the City Council of Zurich decided that not more than 20,000 pieces of timber could be cut annually in the Sihlwald. This is probably the oldest record of a regulation of the forest cut in any public-owned forest.

Beech is unquestionably the greatest fuelwood of continental Europe. It is not only valuable because of its wood-producing capacity, but also because of its cleanliness. It has no equal as a fuelwood. In continental Europe it is prized so highly that no other fuelwood is used if Beech is available. The peasants eagerly collect the twigs and small branches, and after bundling them carry the bundles to their homes, where the faggots are used for general fuel purposes. Such an extensive and complete utilization of all parts of the tree is responsible in a large measure for the attractive and clean forests so common in continental Europe. They stand in strong contrast with some of our American, debris-laden, fire-scarred and devastated forest areas.

A number of ornamental varieties of the European Beech have been developed, and are being introduced extensively into the United States. Among them are the Weeping Beech, the Purple Beech, and Cut-leaf Beech. These three varieties are common in our gardens, lawns, and parks, and will unquestionably continue to hold a promtnent place in ornamental plantings and general landscape work.

The Beech produces nuts that are a nutritious human food. In ancient times they were used extensively by man for food. They were also a big factor in the pannage industry. Thousands of hogs were formerly fattened upon the Beech nuts, and it is said that the resultant pork was exceptionally delicious to the taste.

Next to hunting, pannage was, in the early days of forestry, the chief usage of beech forests in Europe. The records of the pannage industry in Germany date to the Twelfth Century. During the Sixteenth and Seventeenth Centuries the people living near the forest divided the pannage areas among their herds and swine, for at that

THERE IS NO WASTE IN THE BEECH FORESTS OF EUROPE. THE STUMPS ARE LOW AND THE FOREST FLOOR IS CLEAN

time the rearing of swine had attained great importance and produced considerable wealth. Even today hogs are pastured extensively in Serbia, Hungary and Galicia.

The forests of Europe regard the Beech as the mother of the forest soil. It has no equal as a conserver of forest soil fertility. In many localities it is used for

HAULING BEECH BRANCHWOOD FROM THE FAMOUS CITY FOREST OF ZURICH IN SWITZERLAND, WHERE BEECH COMPRISES 75 PER CENT OF THE FOREST LAND

under-planting other forest trees which rob the soil of its fertility. It is a shade-enduring tree and will grow under the canopy of other trees. It produces enormous quantities of leaves which, upon falling to the ground, form a leaf-mulch on the forest floor that in time develops into humus and becomes available as tree food for subsequent forest crops.

No other tree is prized so highly as a soil builder and soil conserver as the European Beech. It is not found in every part of continental Europe, but locally it is a big factor in forest crop production. Just as it is the leading species in the Sihlwald of Switzerland, so it is the foremost tree in the Odenwald of Germany. There is no other tree that can take its place. It has characteristics peculiar only to itself, and supplies products of a kind and quality not produced by any other tree.

The European Beech may be distinguished quite readily from our common American Beech. Its head is more oval than our native tree, and its bark is darker gray. Its leaf is glossy, dark-green above, paler beneath; and it is smaller than the leaf of our American Beech. The cultivated ornamental varieties of Beech have practically all been developed from the European Beech. They can readily be identified either by their copper color, by their weeping habit, or deep-cut leaves.

There is only one kind of Beech native to the United States. It is, therefore, a simple matter to deal with the Beech tree in this country, for it stands alone. It has no nearer relatives than the Chestnuts, Chinquapins, and the Oaks.

Our native Beech prefers rich, moist, bottom lands, but it also thrives on the rich, gravelly, and moist uplands. It is found from Nova Scotia to Ontario, and Wisconsin, and south to Florida and Texas. It often attains a height of 90 to 100 feet, and it is not unusual to find specimens with a diameter of from two to four feet.

EUROPEAN FORESTERS TELL US THAT BEECH IS THE MOTHER OF FOREST SOILS. IT IS USED EXTENSIVELY TO UNDER-PLANT OLD STANDS OF SCOTCH PINE, EUROPEAN LARCH AND NORWAY SPRUCE

The name "beech" has come down from ancient times. It is one of the oldest tree names in use. It is said that the word originated among the old Aryan tribes of Asia, who were among the oldest inhabitants upon the face of the earth that used the written language. For the want of better material, they cut letters on beech bark, and a piece of such writing was called "boc." It was but a step

to the word "book," which meant a collection of written material or "bocs." Both the words "beech" and "book" come from the same word "boc," and the connection between them is very evident. It is said that in ancient times, probably five thousand years before the building of Solomon's Temple, any library beyond the Euphrates River was made up of several cords of trimmed and lettered beech bark. Since this bark was perishable, it has wholly disappeared, and nothing now remains of these early libraries of beech bark.

The distinctive features of our native Beech are so striking and so different from other trees that it may be recognized very easily at any time of the year, and when once known the tree cannot be forgotten. One distinctive feature that is present throughout the entire year, and may always be relied upon, is the Quaker-gray, close-fitting, smooth bark upon which the American youth has been cutting his initials and other outline carvings. The practice of cutting initials upon the bark is not to be commended for it only defaces the appearance of the trunk, and permits the collection of large quantities of filth and foreign material in the cut depressions that are placed in the bark. The Beech is without question the best-groomed of all the trees native to North America. It always appears clean and attractive, and any practice which tends to deface the beauty of this clean tree should be stamped out completely.

A WELL-MANAGED BEECH FOREST. THE FOREST SOIL IS FURROWED TO PREVENT EROSION AND HELP THE GERMINATION OF TREE SEEDS

It is not necessary to rely on a single distinguishing characteristic to identify this tree, for even in the midst of winter one can find striking features. The slender, sharp-pointed, conical winter bud, about three-quarters of an inch long, and covered with ten to twenty reddish-brown scales, cannot be confused with those of any other native forest tree. The opening of these unusual buds in spring time is a process which is worth while watching, for there is no phenomenon in all Nature that is more interesting and instructive. At first one notices only a slight swelling of the bud. Then there appears to be a period of rest, but in reality it is a period of preparation, for all at once the bud opens up and the new growth shoots forth at a rapid rate, and in the course of a few weeks the entire growth of the season is completed. The belief is prevalent that our forest trees grow from early spring to late in fall, but this is not correct. For one year the writer selected one hundred trees and measured their growth daily. He found that most of our common trees make about 90 per cent of their height growth in less than forty days in early spring, and usually rest for the remainder of the year.

Through the long summer months there is no tree in our forest that is more beautifully clad than the Beech. Its leaves are ovate, stiff, and marked with straight veins, and bordered with wavy margins. A close examination of a Beech tree will show that the leaves are produced in large numbers and arranged closely on the twigs. This close arrangement of the leaves forms a dense shade, and in autumn upon falling to the ground forms a dense leaf-cover on the forest floor. There is no forest tree that produces a more copious crop of leaves than the Beech. This accounts for the fact that it is regarded as the mother of the forest soil, for it does not only maintain, but it even improves the fertility of the forest soil. From early to late in the fall the Beech, next to the Chestnut, is the most frequented of the native trees. It produces a triangular, brown nut that is edible. It is prized by man, squirrels, blue jays, and many other domestic and wild animals. A trip to a Beech tree in fall will always be rewarded by finding the ground beneath it covered with prickly burs. Upon opening one of these burs, two triangular, brownish, thin-shelled nuts are usually uncovered, which contain a sweet and edible kernel. The nuts are produced in such large numbers that in spite of their edible qualities, many remain hidden in the leaf cover and germinate the following spring.

One of the most impressive sights in the forest is to see a broad-spreading Beech tree with thousands of small seedlings growing beneath its shelter. The writer has

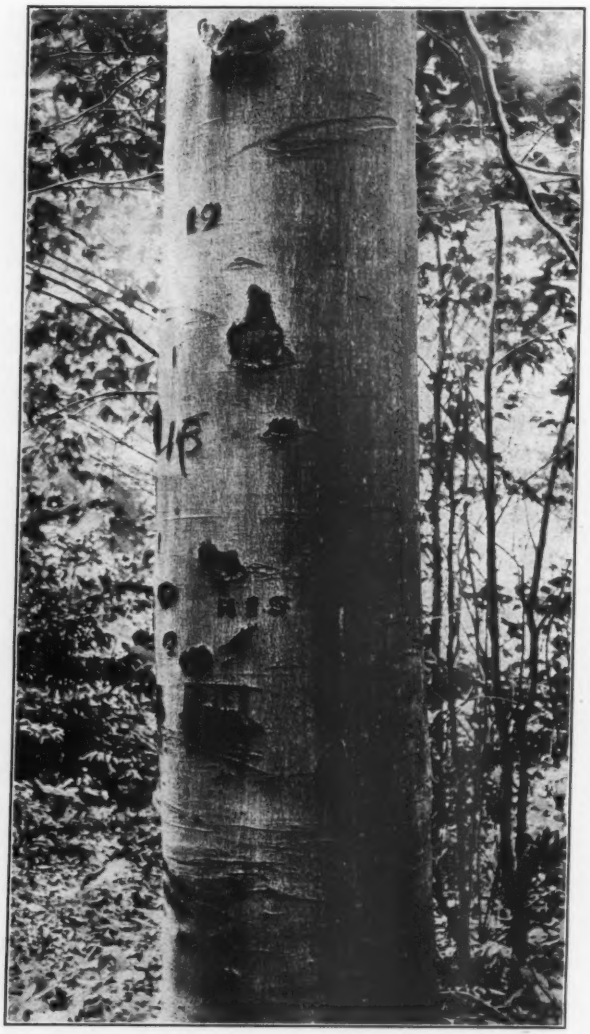
found as many as 143,000 small Beech seedlings on one-quarter of an acre of forest land in the northwoods. One of the strongest weapons that this tree possesses is its power to produce a large number of strong and vigorous offspring. This heavy production of seed insures the continuation of this tree. The young seedlings endure a dense shade for many years. It seems as if they patiently awaited the day when the forest canopy above them will be opened up sufficiently to permit them to begin their height growth and take their place in the forest stand.

The Beech is one of the most clannish trees of the forest. Occasionally one finds solitary specimens, sometimes it occurs in groups, and it is not unusual to find extensive pure stands that are made up almost entirely of Beech. This is attested by the fact that one frequently finds such names as "Beech Flat," "Beech Ridge," "Beech Woods," and "Beech Bottom" in local use.

For many years the wood of the Beech was used little for lumber, but long ago it was given an important place as firewood and furnished much of the raw material in the manufacture of charcoal. In recent years methods have been developed by which Beech wood may be seasoned and treated in such a way that it is now a rather popular wood upon the market. Many million feet of it are now manufactured into flooring and it is being substituted in many places for purposes for which Maple was formerly used almost exclusively. Its modern uses are many. There is scarcely a manufacturing establishment east of the Rocky Mountains that manufactures hardwood commodities, especially those used in the household, that does not use Beech. In Michigan alone there are about 30,000,000 board feet used each year in the manufacture of boxes. It is widely employed in the manufacture of furniture, vehicles, agricultural implements, wooden ware, and musical instruments. Approximately 75 per cent of all the wooden household articles that are sold in 5, 10 and 25-cent stores are made of

THE BEECH HAS MANY DISTINCTIVE FEATURES

1. The pollen-bearing flowers occur in small drooping balls and appear when the leaves are one-third developed.
2. An enlarged pollen-bearing flower.
3. An enlarged seed-producing flower.
4. A branch with mature leaves and ripe fruit burr.
5. A beech seed.
6. A twig with typical winter buds.
7. No other tree has winter buds that can be confused with the long, slender and pointed buds of the beech.



THE QUAKER-GRAY, CLOSE-FITTING, AND SMOOTH BARK OF OUR NATIVE BEECH DISTINGUISHES IT FROM ALL OTHER FOREST TREES.

Beech. It is also used in the manufacture of chairs, brush handles and shoe lasts.

Beech may be regarded strictly as a forest tree. This does not mean that it will not grow in the open, but when it develops in the open it produces poor lumber, and is rather short and limby. It appears that the small Beech seedlings must have shade if they are to develop well, but after the trees have reached middle age they will endure considerable light.

The Ancients loved the Beech and praised it in song and story. Today we regard it highly as a forest tree, for it conserves the fertility of the forest soil and products, and produces large quantities of valuable forest products.

"HALL OF FAME" FOR TREES

The old state of Massachusetts is the banner state for interesting trees. There are several reasons for this distinction. Massachusetts was the chief theatre of the Colonial Wars, and of the Revolution—that great history-making epoch; it is the second oldest settlement; its soil is well adapted to the growth of trees; it was the first state to organize a Horticultural Society whose duty is to give publicity to trees where it is due, as well as to care for them. Thirty years ago this Society issued a call throughout New England for minute records of all "Large, Old or otherwise Interesting Trees." In a few weeks there were two hundred and forty-four responses; giving the variety of the tree, exact location, height, girth, spread

Courtesy U. S. Forest Service.

THE WAVERLY OAK

of branches, age, and particularly the history connected with it. One hundred and ninety-eight of these trees were in Massachusetts! Massachusetts stands foremost of the forty-eight states in her regard for trees. Just a trip through that beautiful, picturesque, park-like state and one will see evidences of this activity on every hand. At Waverly is a group of oaks, recognized by the Forest Service to be more than four centuries old. They must have been quite sizable trees when the Norsemen and the Indians were rivals for dominion in this section of the country. These oaks stand along the bank of Beaver Brook, and show evidences of many a long fierce battle with the summer storms.

"HALL OF FAME" FOR TREES

THE WASHINGTON WILLOW

This Washington Willow at Constantine, Michigan, is nominated for a place in the Hall of Fame for trees with a history by Paul R. Westerville who records with the Association these facts:

In the fall of 1876 the Hon. Franklin Wells and Mr. John Jones of Constantine, Michigan, together with their wives, visited the Centennial Celebration at Philadelphia, returning by way of Washington, D. C.

While in the capital they went to the tomb of George Washington over whose grave weeping willows had been slipped from those over the tomb of the great Napoleon at St. Helena. The ladies desired to take a branch home with them, so Mr. Jones severed a few twigs with his knife and gave them to the ladies.

Mrs. Wells succeeded in keeping one alive by carrying it in a well-moistened handkerchief. All others failed to survive. Upon reaching her home on Washington Street, Constantine, Michigan, Mrs. Wells placed the slip in a wide necked bottle of water and allowed it a place on a south window sill of the house shown in the picture, where with sunlight, air and water it flourished and took root.

In the following spring of 1877 it was planted at the north end of an old-fashioned English garden, where it stood as a sentinel for 40 years. Early in the summer of 1915 on a very quiet Sunday morning at church time, as the minister pronounced benediction this wonderfully well-balanced tree, after a half hour's cracking fell to earth. Its loss was greatly mourned, but after all it is not dead for Paul R. Westerville having admired this tree from childhood, had taken branches to his new home in Kalamazoo, Michigan, where he planted them in parks, cemeteries and other public places.

THE FAMOUS WILLOW, SLIPPED FROM ONE AT THE TOMB OF THE FATHER OF HIS COUNTRY, A SCION OF THE ORIGINAL NAPOLEON WILLOW AT ST. HELENA.

BATTLE GROUND OAK

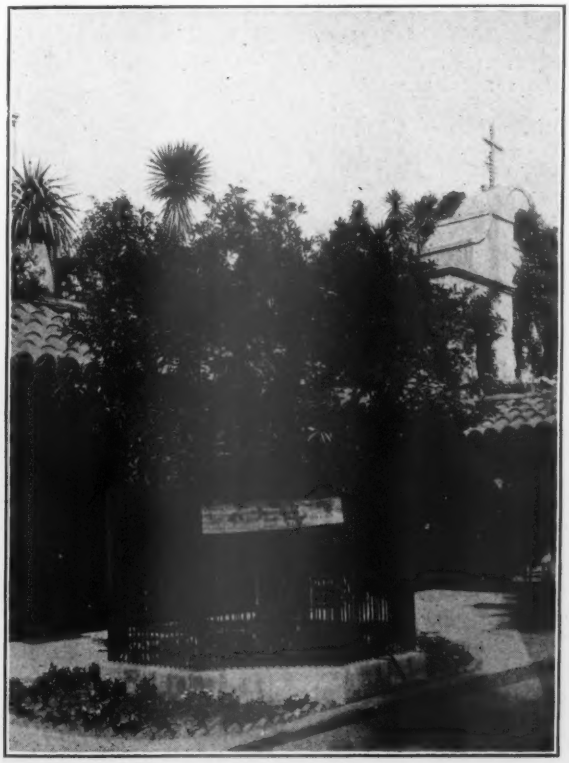
To mark the 140th anniversary of the Battle of Guilford Court House, North Carolina, March 15, 1781, the American Forestry Association announced that "The Battle Ground Oak" had been given a place in the Hall of Fame for Trees with a history which the Association is compiling. The nomination was made by Mrs. Dorian H. Blair of Greensboro, North Carolina, who is the North Carolina State Historian of the National Society of the Daughters of the American Revolution and a member of the Guilford Battle Chapter.

Although the surrender of Lord Cornwallis was at Yorktown, many historians claim the decisive battle of the Revolution was fought at Guilford Court House. General Nathanael Greene directed the battle from beneath this tree, which is now 21 feet in circumference at the base and fifteen feet in circumference at its smallest part. The tree is about 75 feet high and has a spread of more than 100 feet, Mrs. Blair informs the Association. The battle ground is now a National Park.

THE "HALL OF FAME" FOR TREES

THE PARENT NAVEL ORANGE TREE

President Theodore Roosevelt officiated at the replanting of this famous tree at Riverside in May, 1903. At the ceremony, Mr. John G. North, President of the Historical Society, addressed the President as follows: "This little tree is the progenitor of that great industry which has done most to make Southern California famous. Two trees, of which this is one, were brought from Bahia, in Brazil and sent to Riverside by the Agricultural Department at Washington in the year 1874. From these two trees, by the process of budding into seedling stock,



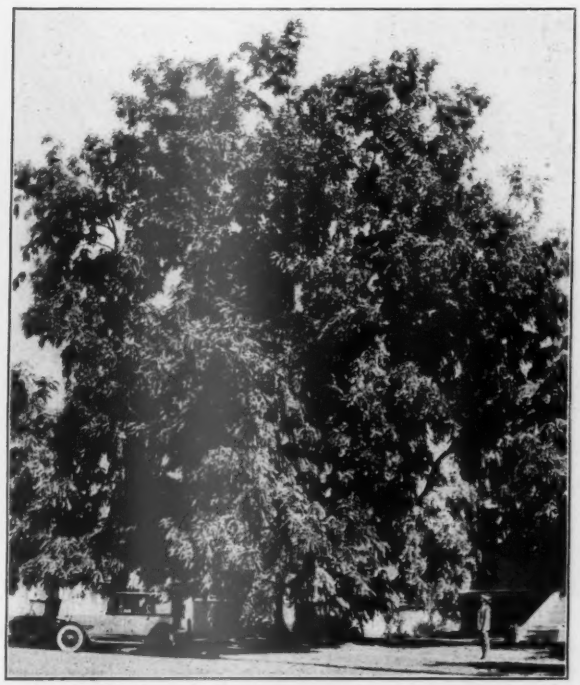
PARENT NAVEL ORANGE TREE IN COURT OF MISSION INN, RIVERSIDE, CALIFORNIA

all of the navel orange trees of California have sprung. The fruit of this tree is so perfect, its descendants so numerous, its posterity so great, its family so enormous that we believe it merits your unqualified approval."

President Roosevelt commented that the tree showed no signs of race suicide. Mr. North then said, "We ask you to plant it in its new home in order that we may cherish and care for it here and that in our thoughts it may ever be linked with the President who planted it for us. We shall protect and care for it, but whatever may happen to it, its life has been so useful, its work so beneficent, its influence so far-reaching that nothing can destroy these. And for yourself, Mr. President, after we have looked into your face and grasped your hand, and your work calls you from us, the great and good things you have done and are doing, the story of your career, the influence and inspiration of your life will remain long with us and continue to bear fruit among us." Prophetic words, as they are recalled today. The tree has recently been nominated for a place in the Hall of Fame by Mr. Frank Miller, of Riverside, California.

FAMOUS BLACK WALNUT

A walnut tree planted at Salem, Oregon, fifty-three years ago by Mrs. Eugene Breyman, a pioneer in the Oregon country, has been nominated for a place in the Hall of Fame of the American Forestry Association at Washington by Senator Charles L. McNary of that state. The tree is a California Black Walnut and stands on the property of Mrs. R. P. Boise, a daughter of Mrs. Breyman. Senator McNary who is in the picture has the measurements of Prof. C. A. Reed of the Department of Agriculture, which show the tree to be ten feet eleven inches in circumference where Senator McNary's head touches the trunk. Several tons of nuts are harvested from this tree every year, Senator McNary informs the



THE OLD WALNUT GIANT THAT WAS PLANTED IN THE PIONEER DAYS OF THE OREGON COUNTRY.

Association. Mr. McNary and Mrs. Boise are brother and sister and the senator makes his home when in Oregon, at Salem.

PALM CANYON, CALIFORNIA

By A. E. Demaray

LYING fifty-five miles south and east of Riverside, California, is the village of Palm Springs, a bit of Arabia transplanted to the western hemisphere. Here a unique winter colony has been established with buildings partaking of near-eastern architecture and with date palms abounding in great profusion. Two or three camels bringing mail and passengers from the Southern Pacific Railroad, five miles distant, are all that are needed to complete the picture.

Photograph by the National Park Service

AN OASIS IN THE DESERT

The palm tree are tall and graceful, and the native life lends picturesqueness to what might be a bit of Arabia transplanted to the western hemisphere.

With this artificial setting to enhance the region there is probably no more interesting motor trip to be taken than the ride from Riverside to Palm Springs. First, there is the change from the humid atmosphere of the territory reached by the winds from the sea to the warmer, drier air of the desert region, a transition not gradual but abrupt, as the State highway is traveled through the pass north of the San Jacinto Mountains. Next, there is the wonderful panorama of the desert with numerous man-made oases of irrigated lands and always with the towering mountain range above, then the village nestled on the edge of the desert at the base of Mt. San Jacinto.

But a few miles to the south is the supreme climax in this land of climaxes. Here in several canyons are growing scores of the beautiful Washington palms, the only native palms in California. There are many other varieties of plants, including several interesting cacti,

Photograph by the National Park Service

NATIVE WASHINGTON PALMS

A bit of the little village of Palm Springs, nestled on the edge of the desert at the base of Mt. San Jacinto.

and the whole forms a most extraordinary botanical collection. There are three canyons—Palm, Andreas and Murray—all in comparatively close proximity to each other. Palm Canyon is the largest, and for a distance of 10 miles the native palms grow along the shores of the little stream that flows through it. Most of the trees, however, are concentrated in relatively small areas in each of the canyons near the point where their streams leave the hills. As the streams leave by tortuous routes it is impossible to see into the canyons from along the highway and it is necessary to ascend to points considerably above their floors in order to look into them and reach their palm groves.

Hence the supreme surprise of the visitor making his first trip. No palms or indication of palms are seen on the ride through the desert south of the village nor dur-

Photograph by Mode Wineman, Courtesy National Park Service

MAGNIFICENT PALM CANYON IN CALIFORNIA

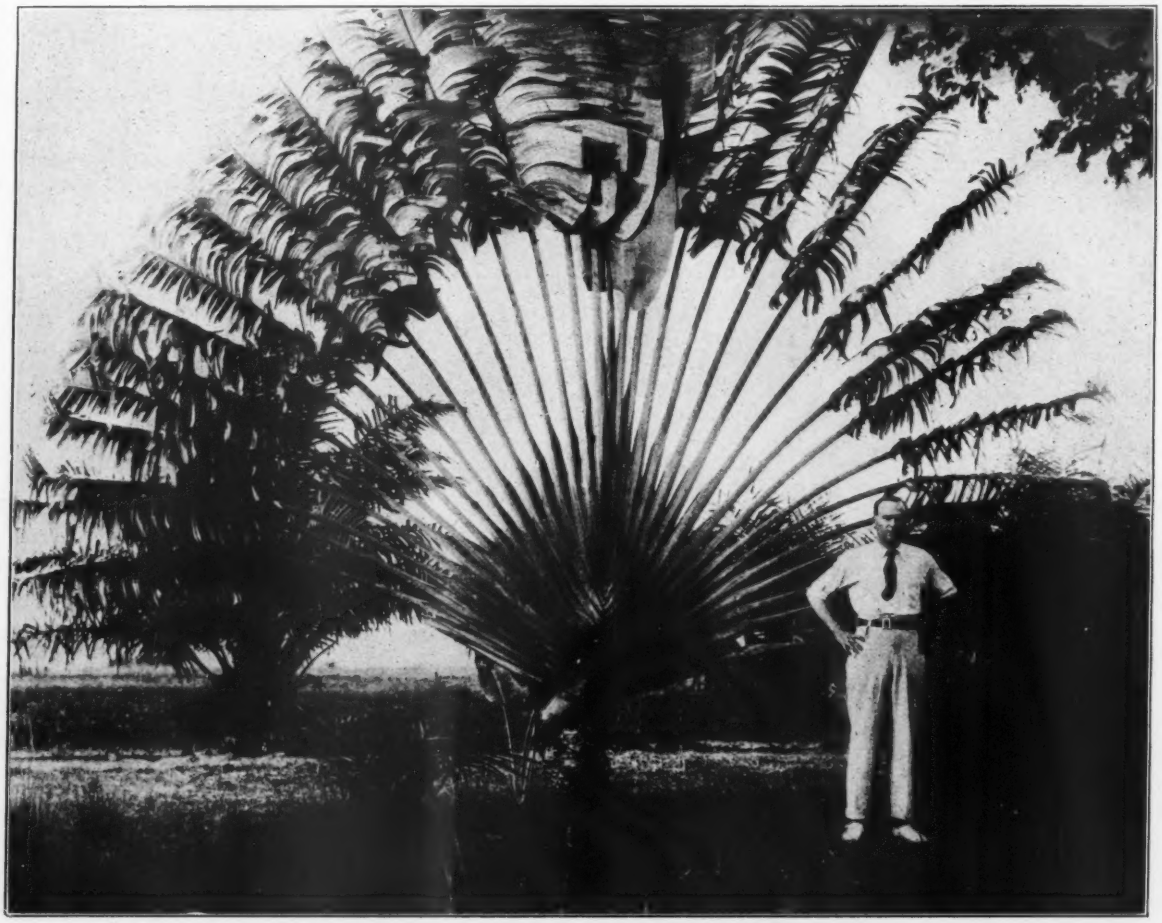
It is a gripping scene, and the surprise of the beholder is complete and overwhelming—leaving the desert to come suddenly on a canyon filled with palms centuries old.

ing the ascent of the foot hills of the San Jacinto Range through vast areas of desert flora. Leaving the car and climbing on foot a ridge is reached and spread below is a canyon filled with palms centuries old. It is a gripping scene, and the surprise of the beholder is complete and overwhelming. It requires but a moment to descend to the water's edge.

Again the situation is superb! Mt. San Jacinto towers directly above and the views up the canyon are closed by tremendous buttresses of tinted rock. Looking down Palm Canyon the desert is disclosed and beyond are other ranges of mountains. In form, in color and in proportion it is a scene hard to surpass.

The palm trees are tall and graceful, but most of them present an unkempt appearance with their "skirts" hanging dry and lifeless about their trunks. Many of the biggest and oldest trees have been burned numerous times by the Indians of the Agua Caliente Reservation, to whom the lands belong, in connection with certain ceremonies performed with the burning of the palm "skirts" while still on the living tree. Fortunately, the ceremonial fires do not apparently seriously injure them. But many of the trees are being cut down and carried away for various purposes and there is a great necessity for taking steps to save the unique growth.

A bill has been introduced into Congress to preserve the area as a national monument. As the lands belonged to the Indians it was necessary to secure their consent. The bill has been passed by the House and the Senate and now only awaits the signature of the President to become a law—"a consummation devoutly to be wished."



Wide World Photograph

A BEAUTIFUL PALM FOUND IN AFRICA

A remarkable palm tree, which grows into the shape of a palm fan in Forcadas, Nigeria, West Africa. It is known as the traveler's palm, on account of the fact that one branch broken off would provide a good drink for a thirsty traveler. A remarkable feature of the tree is that the branches grow separately from East to West.

CABINWARD--CABINS OF NECESSITY

By Robert Sparks Walker

ON THIS subject, one who has lived in a cabin of necessity ought to be able to write fully and convincingly. Having a number of years' experience of cabin-life from the fact that necessity compelled my father to utilize the trees of the virgin land in a sort of primitive fashion, I hope I may be pardoned for making the statement that this much of "Cabinward," is a mere reflection on the past. The first thing that comes to our mind is, what really is a cabin, anyway? We hasten to ascertain what the old lexicographer says, and we turn with curious interest to the dictionary to find that he defines the word as meaning "a small home, cottage or hut." In the minds of the American people from custom and usage there has been established a definition which is a little bit different and which stands out more distinctly than the one left by Webster, for it is generally understood that a cabin is a small, rustic house built of logs. It is of no little interest to note how the meanings of words of this kind sometimes change. For example, the word cottage formerly referred to a small house of the poor, but now reference to a home by the use of the word immediately suggests a charming sentiment that carries with it no thoughts of poverty whatever.

THE HUMBLE COT OF A LOVER OF FLOWERS

This cabin of necessity has been made beautiful by the profuse planting of blossoming flowers.

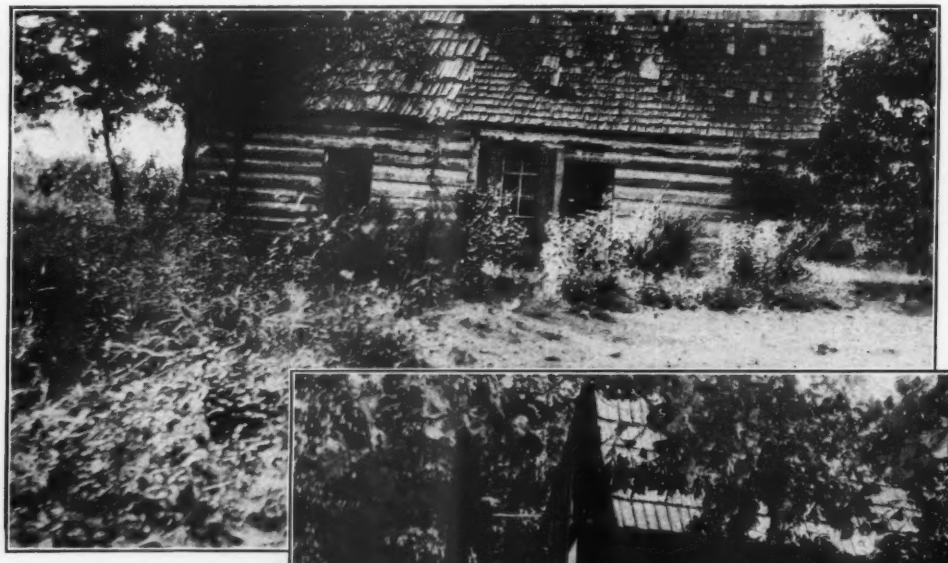
In the real cabin of necessity, however, there was not an intimation of sentiment and no such thoughts were ever associated with it, because it was the dwelling place of our ancestors who were pioneer settlers. The thought of being compelled to dwell in a cabin was sharply if not bitterly spurned by proud young Americans for a century or more. This unfavorable consideration of the homes of American pioneers came naturally. Our early settlers were a proud and ambitious people. They yearned for something better than a mere log hut—a house of more dignity, more spacious and more expressive of their ambition to call home. So we cannot blame their descendants from cherishing the thoughts of a mansion. But despite the fact that proud ambition went lurking within the hewn logs of our ancestors, something greater had its birth there. Life in these cabins produced the only quality and the necessary quality to temper proud ambition. That quality and great leveling power was humility. It is quite impossible to surround a cabin—just a plain, log hut—with any other kind of atmosphere than humility. This alone has made more American statesmen and other great men than any other influence in this country. The thing that made Abraham Lincoln great,

A TYPICAL MOUNTAIN CABIN

Well sheltered from the rains, this cabin of necessity—the home of an old bear hunter in the Smoky Mountains of North Carolina—illustrates one great use of forest trees.

and indirectly his name immortal, was simply a log cabin of necessity and humility. Cabin-rearing means for the individual, the tempering of a proud spirit. It was the cabin life that helped Abraham Lincoln appreciate the old, old poem, "O Why Should the Spirit of Mortal Be Proud?" To me today every cabin I observe bears a close likeness to that poem. To store all possessions and rear a family in a small cabin was to bow the knee in humility and this too meant industry. The sign of industry is a closed cabin door. Toil calls the occupants, both young and old to the fields of growing crops.

But it is interesting to study how sentiment changes. The cabins of necessity have not disappeared, but they are on the wane. Though vanishing, some families of the present generation are still being nurtured in these charming houses built of logs and dirt, and particularly is this true in the South. It is doubtful however whether the last cabins of necessity will disappear until the American forests have been depleted of cabin timber. That will be many years to come. Not until then will they be doomed and so little fear is felt for extinction of the honorable mud-besplattered buildings.



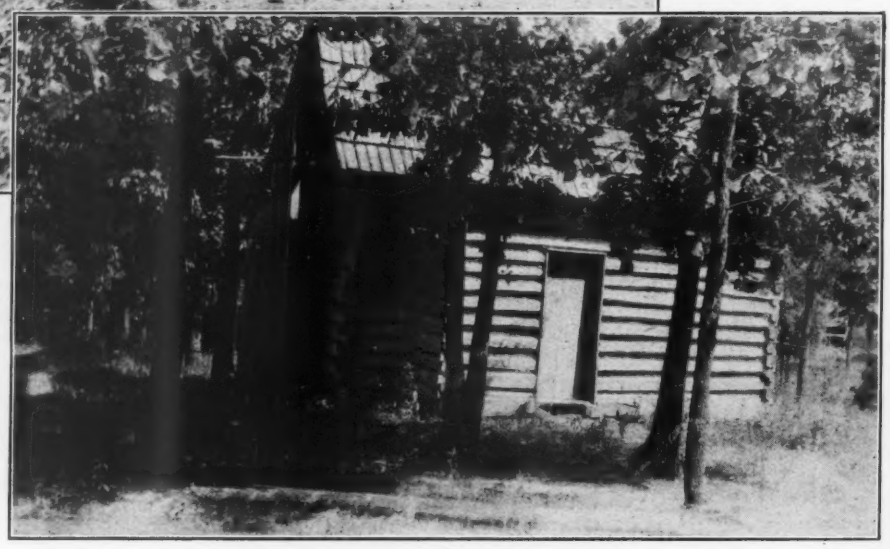
A TWIN CABIN

This little cabin of necessity was enlarged as the pioneer's family grew in size.

The cabins of necessity have been melting under the heat of ambition forcibly moved by prosperity. Prosperity and ambition are sworn enemies to the cabins of necessity. Necessity cuts through the epidermis, and man's advancement is a series of successive moults. Today we look on many thousands of handsome and expensive mansions where not many years ago there stood on the same site a cabin of necessity.

In addition to steeping the occupants' souls in humility, the cabins of necessity blessed them otherwise. They brought no worry over house-painting, of fire insurance policies or house furnishings and the periodic house-cleaning time. During the cabin age of our ancestors, disease germs were practically unknown. The cabin of necessity is a bitter enemy to germ life. This is not at all strange, for fresh air and sunlight permeates the cracks and crevices of the cabins of necessity, and so disease germs are never bred or harbored within their walls. This, I think, in itself answers the familiar question, "Why were our ancestors so healthy and free from disease?"

The popularity of the automobile will lead "cabinward," but not towards the cabin of necessity. A man who can afford an automobile, will not possess such a building. In driving out one pike road in a country where educational facilities are excellent, with high schools as well as grammar schools dotting every locality, in a twelve mile drive on a single thoroughfare, five cabins of necessity are passed. The pictures are all shown here. They are not pioneer Americans who live in them, but the occupants are tillers of the soil. They are not colored people either who have been thus tucked away cheaply by some aristocrat, but white families, who regard the Sabbath and believe in the principles of sani-



ATTRACTIVELY SURROUNDED BY TREES

Happily located, this cabin of necessity has a leanto—a step forward in the evolution of home building in the forest.

tation, and who go to their meals with pure hearts and clean hands as well as good appetites. This is maintaining the old pioneer standard of living, and the same atmosphere imbued with humility still pervades these

PLAIN AND SEVERE IN LINE

This cabin was built in a country where necessity compels the use of shingles instead of boards for roofs, and brick instead of rocks or sticks for a chimney.

humble dwellings of people not extremely poor, but merely with limited means.

As the long train of automobiles glides past these humble cabins, sincere appreciation of their beauty and simple and rustic architecture is expressed. The large, commodious mansions that stand near the cabins go begging for warm words of admiration, while the

JUST A CABIN OF NECESSITY

The closed door indicates no lack of hospitality on the part of the owner, but simply denotes his absence in the fields.

cabins of necessity are claiming the attention of the close observer. And then, if a halt is made, it must be made at a cabin. To do otherwise would reflect on the fancy of the stranger. The camera man passes all else by, yet finds it difficult to slip past an humble cabin a second time without again halting. He who passed is truly sorry that he has no business that will justify or warrant his making another exposure!

The twentieth century occupant of a cabin of necessity finds no life of sentiment in his home, due to the particular structure. He may have peace, contentment, flowers, and a few dogs and cats, and feel the charm of living within a wall made of nature's limbs, but he did not choose this type of building for a home simply because he liked it more than any other. The cabin of necessity was all that was open to him. It was the only solution to the housing problem—the owner of the land had the muscle and brain, his land had the timber. Like a chemical action, the combination resulted in a cabin, and he steps "cabinward" with a proud ambition of some day being able to convert his into a modern manse, like the insect that must moult and thus change a skin each time physical growth takes place.

LONE TREE OF 1849

THERE was an immense cottonwood tree four feet in diameter and very tall, which stood in Nebraska almost in the center of the continent, between New York and San Francisco, which was within one mile of that center. Under its branches rested thousands of 49'ers en route to the Eldorado of the Pacific coast. It was the best known camping ground on the old California trail. From 1849, when the gold seekers rushed across the great plains down to the completion of the Union Pacific Railroad, the great tree was a guide post to the wagon trains going West. After the railway was completed there was no further use for the old tree and it eventually rotted away and died. A monument has been erected on this spot, representing a trunk of a cottonwood tree, and bearing the inscription: "On this spot stood the original Lone Tree on the old California trail."—*H. E. Zimmerman.*

MONUMENT TO THE LONE TREE

HAWTHORNE particularly enjoyed planting trees on his estate. In the romancer's declining years he spent much time seated under the shade of his trees. It was here that he received his many distinguished visitors. And it is said that he never failed to call attention to his wonderful trees.

Tree Stories For Children

A Tree With Strange Apples

By Mary Isabel Curtis

YOU have never seen a tree with golden apples, have you? Neither have I. But there was such a tree, so I've heard, that grew in the garden of the Hesperides in those far off days when many things happened that seem strange to us now.

The garden where this wonderful apple-tree grew was so far away from where everybody lived and so hard to find that very few people saw the tree, even in those days. Besides, if anyone did find the garden it was next to impossible to pick any of the apples because a horrible dragon with a hundred hissing heads guarded the golden apple-tree, and this dragon never slept.

Now Hercules wanted some of these apples. Hercules was the strongest man that ever lived. Why, he was so strong that he could grasp a big tree with one hand and uproot it as easily as you could pick a dandelion! So he started out to find the way to the garden, and after walking many days he came to where a huge giant stood in a deep forest, holding up the sky on his great shoulders.

"Can you tell me how to find the garden of the Hesperides?" shouted Hercules with all his might in order that the giant, far up in the clouds, could hear him.

"To be sure I can," thundered the giant whose name was Atlas. "But who are you and what do you want in the garden?"

"I am Hercules," replied the other, "and I am after some of the golden apples growing there."

"I've heard you are a strong man, Hercules," said Atlas. "Do you think that you are strong enough to hold the sky upon your shoulders?" Hercules thought what a great thing it would be if he could boast that he had had the strength to bear the burden of the sky; and the upshot of the matter was that Atlas agreed to go for Hercules and gather the golden apples if Hercules would hold the sky till he returned. So Hercules climbed a mountain nearby, to make himself as tall as possible, and received the sky upon his shoulders, and the giant strode away.

To tell the truth, the sky was very heavy, and Hercules was glad enough when he saw Atlas coming back again carrying a branch from which hung three great, golden apples. But the giant had enjoyed his little vacation, not to mention the pleasure he had had in killing the hundred-headed dragon, and he was in no hurry to take back the burden of the sky. "You keep it a while longer," said he, "and I'll take the apples for you anywhere you say."

Hercules was dismayed at this suggestion, but he didn't dare to show it. After hesitating for a moment he agreed, only he asked Atlas before he went to hold the sky for a moment—"Just while I make my coat into a pad for my shoulders," he explained.

"Certainly, I'll do that," said the stupid giant; and throwing down the apples, he took back the sky. Then Hercules picked up the three golden apples and marched off while Atlas shouted after him in vain. Now, when you hear the thunder rumbling you can fancy it is Atlas calling to Hercules to come back again.

PRACTICAL MAHOGANY PLANTING

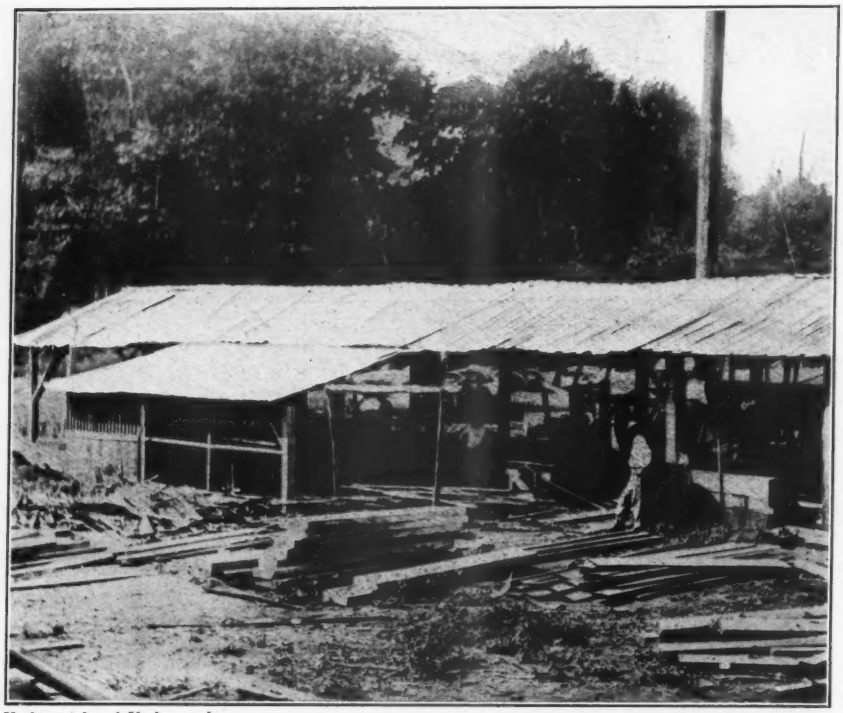
PROFESSIONAL foresters who are familiar with tropical forests and forestry are occasionally called upon to furnish practical information in reference to planting and cultivating mahogany trees, says the *Hardwood Record*. The demand for mahogany lumber, especially in the American markets, and the extensive tracts of unused land suitable for growing the American mahoganies, serve as an inducement to intelligent landowners and corporations to turn their attention to these trees. For the production of artificial groves, timber belts, and shade for public roads mahogany is pre-eminent over all other varieties of tropical American timber trees. It is without doubt among the most profitable kind for forestry purposes and is at the same time one of the most widely distributed of all tropical evergreen trees. In its natural range it grows more or less sparingly from Tampico in Mexico southward through Central America into South America and through the principal islands of the West Indies, including the extreme southern portion of the state of Florida.

GETTING MAHOGANY OUT OF THE GUATEMALA JUNGLE FOR AMERICAN CONSUMPTION

Cutting down a big mahogany tree in the jungle of Guatemala. The lumberjacks were employed by an American, running a sawmill at Obispo, near the West Coast. Within a year over 200,000 feet of mahogany were shipped to the United States via Puerto Barrios on the east coast, and New Orleans.

Its natural range, however, has been increased to the south by planting. In the Guianas, northern and eastern Brazil, the tree has been planted in a small way, chiefly for shade, and grows remarkably well. In East and West Africa small experimental plantations of the American mahogany have also been successfully made, and in India it thrives equally well and makes phenomenal height growth during the first two decades of its existence. A great many fine trees are now growing in parts of India, Ceylon, and the Sunda Islands. In fact, plantations have been made in the Philippines and also in the Fiji Islands with evident success. Thus far in tropical America mahogany has been planted to a very limited extent for the timber, to a greater extent for shade and ornamental uses. There are two distinct species of commercial mahoganies growing naturally in tropical America. One is the Spanish or small-leafed mahogany (*Swietenia mahogni* Jacq.) and the other is the Mexican or large-leafed mahogany (*Swietenia macrophylla* King). There is a third kind which some botanists recognize as a distinct species (*Swietenia humilis*), but this is a small tree and grows only in the elevated parts of Mexico. It has been reported from Venezuela, but its presence there seems doubtful. The Spanish mahogany is usually found growing on the uplands and well-drained areas. It has small leaflets of a dull-green color and an open crown. The wood is hard, heavy, compact, dark-colored, and many of the logs exhibit considerable figure. The Mexican mahogany generally grows in the lowlands where the soil is not always well-drained. It has large leaflets of a glossy-green color and a dense broad crown. The wood is comparatively soft, light in weight, and in color somewhat resembling Spanish cedar. Only a small percentage of the logs show figure, but the wood works well and darkens with age similar to the Spanish mahogany. The Mexican mahogany has the advantage over Spanish mahogany because it grows nearly twice as fast during the first twenty years. For this reason nearly all the plantations consist of the Mexican mahogany, which grows up in a uniform stand and develops long, clear boles.

The Mexican variety is by far better adapted to widely varying conditions and gives very good results. It will grow in many localities outside of its natural range of growth without appreciably affecting its form and rate of growth. The most favorable range for economic planting is in the fertile valleys and moist slopes of hills and mountains in any part of tropical America. On



Underwood and Underwood

THE LITTLE SAWMILL OF BIG ACHIEVEMENT

The little Wallace sawmill, which cut over 200,000 feet of the finest mahogany lumber for the manufacture of airplanes in the United States. This mill was run through the rainy season, at a time when all other mills in that land of *manana* take a long rest. Wallace went into the Guatemala jungle with only two or three white men to help him set up a little sawmill, hired a crew of natives and got to work.

upland soils, especially toward the northern limits of its natural range, Mexican mahogany makes a slow growth. In good soil it grows rapidly into trees of noble proportions. Its presence is usually an evidence of good soil, and in Mexico it is often referred to as a "witness tree," being regarded as a "witness" to good soil. The ideal conditions for its growth are found in the rich, moist soil of bottom lands or on fertile hillsides. A calcareous soil or a sandy loam, containing a large quantity of humus, overlying a deep subsoil of gravel and a water table in which the long tap-roots can find a normal supply of moisture, furnishes the best conditions for mahogany growth. Under such conditions the rate of growth is fairly rapid and is continued up to a mature age. In good situations individual trees have made a diameter growth of nearly an inch a year, but under average conditions an increase of three-eighths to one-half is all that can be expected and lumber of good merchantable quality will be procured in from forty to sixty years.

The trees are very easily planted. Seeds may be gathered or purchased in southern Mexico or British Honduras and planted in beds during June and July. When the young trees are one, two, or three years old, they are set out in rows ten by twenty feet. They grow readily and need very little care and no cultivation. While success is possible without any further attention in many cases it is far safer to keep down tall weeds and any other plants immediately surrounding the young trees for the first two or three years so as to give them a good start.

Underwood and Underwood

A HUGE LOG ON THE WAY TO THE MILL

Logging in Guatemala for mahogany lumber. The crew had to work two days with a team of twelve oxen to get this big load to the mills.

Land suitable for growing mahogany trees can be bought in almost any section of the West Indies and the Spanish Main for less than two dollars an acre. In fact, free concessions can be procured from some of the governments in Central and South American countries for establishing mahogany plantations.

It is difficult to show just how profitable it will be to grow mahogany trees on a commercial scale. The question will naturally be asked when returns may be expected and how great these returns will be. The first trees should be ready for felling in twenty or twenty-five years, but by that time the market price of mahogany will undoubtedly be much higher than today, since there is no danger of over-production. The advantage of having these trees on a comparatively small area reduces the expense of getting the logs to market and increases the profit over that in getting the logs from the natural forest. The initial cost of establishing the plantation is not very high. An estimate of the cost of forming a mahogany plantation of one hundred acres and the probable financial results are given above, labor costing fifty cents a day.

Expenditures:

Clearing 100 acres for planting	$ 1,275
Nursery stock	600
Preparing holes and planting	1,125
Total cost first year	$ 3,000
Cleaning and supplying first and second year	1,500
Care and maintenance up to sixtieth year	11,400
Interest on the money invested	14,100
Total cost	$30,000

DISAPPEARANCE OF OUR HARDWOODS

A GOOD deal is said from time to time about the lessening supply of timber in this country, due to lumbermen, land clearing, and fire; but there is reason to believe that the American forests were losing out before men had anything to do with the matter and that more kinds of trees had disappeared than now remain. A bulletin compiled by Frank Hall Knowlton and published by the Department of the Interior at Washington, says the *Hardwood Record,* indicates, if it does not prove, that our forests were richer in trees, particularly hardwoods, a great many thousands of years ago than they were at the time of the discovery of America. The evidence is found in the records of geology, where imprints of leaves have been preserved in the rocks, telling of species which were living at the time the clays were deposited which later changed into rock.

An examination of the lists of leaves thus preserved shows that many species once growing in America are no longer found here. For example, there are now two species of persimmon in the United States. There were once seventeen species. Fifteen have disappeared. The record goes back to Cretaceous time, some hundreds of thousands of years ago.

There were eighteen species of yellow poplar. Only one remains. Some of the most ancient had leaves shaped much like those of willows, except that the apex was cut off, with the telltale notch which identifies yellow poplar to this day.

There is now a single species of red gum, but twenty-three species once grew in the American forests.

There were twenty-three kinds of elm then, and five are here now.

Our single species of sassafras is all that remains of the twenty-five species which once grew on this continent.

We still have three sycamores, one in California, one in Arizona, and one east of the Rocky Mountains, but there were once thirty kinds.

There are now four kinds of walnut in this country, but thirty-five kinds grew here in the past.

Our forests are still well supplied with magnolias, there being seven; but thirty-nine species grew in America at former periods.

Cottonwoods, including the aspens and balm of Gilead, still number ten species in the United States, and it is a generous number; but no fewer than eighty-three species left records in the rocks during past ages.

Two fig trees survive, both in Florida; but these are the lone survivors of ninety-nine species which once grew wild in the American woods.

But the most interesting of all the record of oak. This is now the most abundant hardwood of the United States. It is most abundant in actual amount of wood and also in number of species. There are now fifty-two in this country; but these are no more than the respectable representatives of 126 kinds of oak which once grew here.

The foregoing figures should be qualified in one particular. In most instances the past records are preserved by leaf prints in stone or clay, and the print of a leaf does not tell how large was the tree from which it came. Some of those enumerated above may have been only shrubs, or small plants. There is no way of certainly determining that fact when the tree itself was never seen, and no part of the trunk has been preserved. The leaf is the most perishable part of a tree, next to the flower; yet all we know of scores of tree species which once grew in this country is derived from leaf impressions in mud—and mud itself is not usually regarded very durable. Yet, how much valuable knowledge has been obtained from such perishable things as leaves and mud! Some of them have come down to us through a million years. By the aid of such records it is possible to understand pretty accurately what our ancient forests contained and what they would have looked like, if a human being could have been there to see them.

WOMEN CALLED TO ENLIST IN FIGHT TO

New York Telegram—"Westward the course of empire took her way some time ago, and the history of the lumber industry shows it followed the same trail. The movement has been from the East to the Lake States, to the South and thence to the Pacific Coast," says the Boston Post. "This is the last stronghold. All this has come to pass in two generations. At present we have enough remaining timber to last perhaps two generations more, according to the American Forestry Association. Thereafter we will have to depend for supplies upon home grown products.

"We have the forest land, we can keep it producing trees, we can replant such areas as are denuded. There are about eighty-one million acres of suitable land idle, Charles Lathrop Pack, president of the Association says. If we do not delay in adopting a proper forest policy, we can assure by the practice of forestry the future of the American lumber supply. There is no other way.

"A treeless United States would eventually mean a sterile United States through the gradual drying up of rivers and other water ways, the arteries of fertility."

Isn't this something for us, everyone of us, to think about? Woman with her vote can make it count in the preservation of our forests. And every woman who has ground can dedicate a corner to the planting of a tree.

Grand Rapids Herald—The American Forestry Association has presented fir seeds to the French government to aid in the reforestation of territory denuded by battle. This will plant 30,000 acres and will go a long way toward providing a future supply of fir timber for France. France lost some of her timber because of attack by German shells, but the United States lost much more through inroads of the ax. France has an excuse for her present plight. The United States has no excuse. France has had her denuded battlefields only four years. Michigan has had thousands upon thousands of waste acres for a generation. It's about time we started on a serious basis.

Pottstown News—Millions of tree seeds have been given to France and Great Britain by Charles Lathrop Pack, president of the American Forestry Association, for the restoration of forests in the devastated war areas of France and the tracts of forests cut down in England for war purposes. Unless we in America stop destroying our forests, our country in another generation may be as lacking in forests as France. The area of forest land swept by fire each year is about twice the area cut over annually by logging crews. With a little common sense, Americans would raise a yearly crop of trees, just as they raise wheat, corn, cotton, etc.

New Rochelle Standard—The planting of memorial trees is not an uncommon thing since the war. There are parks and boulevards in many cities which have been thus graced in memory of some of America's war dead. There is little need to go into the advantages of such a memorial. There are vast areas of unimproved land suitable only for tree planting. There are miles of shadeless highways which cry aloud for road-side beautification. If every county in the United States could, some day, have a memorial forest, the problem of forest conservation would practically cease to exist, and the nation would possess a chain of noble monuments of lasting and perfect beauty.

Washington Herald—Do you remember the name Hough, Franklin B. Hough? Most likely you do not for he was born 100 years ago, July 20, at Martinsburgh, Lewis county, N. Y. Few will remember the name yet he has as unique a monument as any man born in the last century, for Hough is the man who, after years of struggle, got the government to start a forestry bureau.

His centennial year is also the semi centennial of the first Arbor Day, J. Sterling Morton having started that in Nebraska in 1872. Rothrock, the dean of forestry has just died and now Charles Lathrop Pack, president of the American Forestry Association is carrying on a campaign of education on a scale such as those three old timers never dreamed of. Importance of forestry between the time of Hough and Pack is seen in the fact that Congress appropriated $3,000 for Hough to start with. That would not pay the annual postage of the American Forestry Association today.

If you do not think the work Hough started and Pack is carrying on to interest the people in forest protection is far-reaching, try to name something into which the cost of forest products does not enter. This paper you are reading, the chair you are sitting in, the house you would like to build, the desk your child uses in school, your pencil, your golf club, the box in which came the peas the wife bought this morning—but why continue?

We must begin producing trees on a wholesale scale. Hough saw the trees were dwindling when he handled the census of the state of New York away back in 1855. If something is not done we may find ourselves where he said we would be in 1955. A national forest policy is one thing this country needs.

Looks Like No Forest Policy Means No Lumber

Albert J. Reid
FOREST EFFORTS
WHEN THE TIMBER OWNER BUYS THE LAND AND PLANTS THE TREES —
FOREST EFFORTS
TAXES
AND PAYS TAXES EVERY YEAR AS THE TREES SLOWLY GROW —
TAXES
FOREST EFFORTS
INTEREST
AND HIS SON CONTINUES TO PAY TAXES AND INTEREST FOR ANOTHER TWENTY FIVE YEARS
FOREST EFFORTS
AND IN THE END ALL IS WIPED OUT BECAUSE OF INADEQUATE FIRE PREVENTION

—Tampa Tribune.

Florida Farm and Live Stock Record—Forests are wealth. Four-fifths of the South's virgin timber is gone, according to Ovid M. Butler, forester of the American Forestry Association. Southern mills dominated the great northern lumber markets for a score of years, by reason of their proximity to those markets and of the desirability of our yellow pine lumber. The naval stores industry must vanish if the pine forests disappear. And Florida furnishes the greater part of the naval stores of the country.

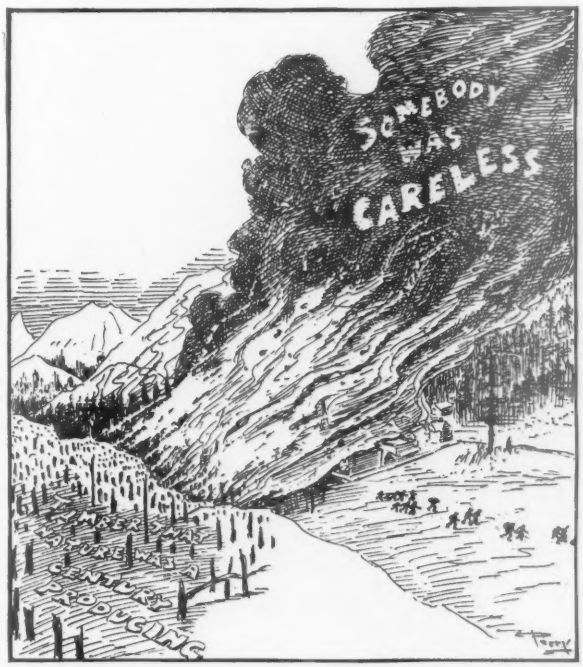
SAVE THE FORESTS OF THE UNITED STATES

New York Mail—As matters now are, it will only be a comparatively few years until the Canadians completely control the paper-making industry. But that condition is not inevitable if this country wakens up to the fact that it still has tremendous possibilities of forest development and that our forest asset must be developed not only to save our paper-making industry, but to keep the price of all wood, which is an essential in practically every industry, at a reasonable level.

Columbus Dispatch—Measures are now before the senate looking towards the establishment of a forestry experiment station in the upper lakes region. Charles Lathrop Pack, president of the American Forestry Association, urges the business men of the upper lake states especially Michigan, Wisconsin, and Minnesota, to get behind these bills if they wish to see 20,000,000 acres of idle land within their borders again put to work in growing timber trees. The three states named led the entire country in lumber production for about 40 years. But they cut their wealth of trees away almost without thought of conservation or reforestation and today they are relatively unimportant factors in lumber production.

Newark, O., Tribune—We read that the American Forestry Association is now engaged in giving free seeds to Great Britain and to France. It is to be estimated that the gift to France will reforest one hundred thousand acres of destroyed forest lands. Until we read this we had no notion that this Association was engaged in this business on such a gigantic scale. It will be realized however, that the value to France of such a gift would be difficult to estimate with its tremendous areas of land devastated with the French people so occupied with their absolutely essential pursuits, as to prevent them procuring at once the necessary seeds, the value of this gift will be readily seen. Then too, the need of wood for purposes of war, the extra amount cut for fuel in a land where the supply is all too scarce, has made a dearth of timber throughout the whole of the country, where it was untouched by the direct ravages of the war. A movement in the United States for reforestation is making great headway and vast tracts throughout the country are being restored as it were to a condition of forestation and incidentally of game preserves. For a hundred years there has been ruthless destruction of timber in the United States, and the necessary diminishing of it in Europe, and the movement now for reforestation on extensive scales will afford a boon to coming generations, and incidentally this restoration will mean the revival of so much natural beauty which has been rapidly destroyed by this deforestation ruthless or necessary.

The Story the Forest Fire Tells



—Portland Oregonian.

Boston Herald—The chief trouble is that the trees are not being renewed fast enough to provide adequately for the country's future requirements. Much was done to improve the situation when, largely as a result of work by the American Forestry Association, our national government committed itself to the policy of forest reservation. The country-wide problem now is that of reforestation; it is to the country as a whole that the Federated Engineering Societies look for help. And they have done well in their appeal for forest renewal to stress its recreative and esthetic sides.

Atlanta Journal—Merest prudence demands that Georgia take due steps, by way of cooperation with the national government in guarding her ever more valuable forests against fire. The example has been set by a number of southern states, notably Virginia, North Carolina, Tennessee, Louisiana and Texas, all of whom receive allotments of government funds supplementary to appropriations of their own for this important purpose. Georgia took a good stride forward in creating, last year, a state board of forestry whose primary business is to investigate and to recommend needful measures.

Clinton, Ill., Ledger—Congress next year will undertake to formulate a national forestry policy to save a remnant of our disappearing timber supply. The move comes about a century late.

Illinois State Journal—It is quite well understood that forestry is one of our national problems. Its seriousness is pretty well recognized throughout the land. Definite movements are on foot to develop public opinion for a practical, sane and productive program to restore timber devastation and to insure to the future a reasonable supply of lumber. The other necessities for forestation are not being lost sight of, as the damages from floods and soil erosion make themselves clear to the naked eye. A timber denuded land is a lost land, unfit for habitation, cultivation or the sustenance of animal life. The problem must be attacked on a national scale.

Huntington, W. Va., Herald-Dispatch—Hundreds of hilltops through the south, hundreds of denuded mountain sides in the west, thousands of acres of swamp lands, boggy river bottoms and cutover areas throughout the country are merely awaiting seeding and care to grow again into forests. It is a vital, practical measure. It needs the interest and support of every citizen of the United States who has imagination and love of country sufficient to make him look even ten years ahead. We have an American Forestry Association and a Forestry Bureau in the government. Neither has the public interest nor support it needs. It is the task of the layman to render that interest and support.

Giant Elm Falls

TO the record of losses caused by the terrific storm of Sunday afternoon, June 11, must be added the falling of the giant elm at Middletown, Connecticut. The picture and facts regarding the tree have been sent American Forestry by Mr. C. K. Dechard, of Meriden, who informs us that as the tree had been showing signs of instability for some time, the owner had arranged to have it taken down on Monday, June 12th, the day after the wind did the job. It was one of the largest elms in the country and located in the Westfield district, Middletown, Connecticut. The trunk measured 18 feet in circumference six feet above the ground and 23 feet 2 inches where the first limbs commenced to branch out.

THE FALLEN GIANT

The tree fell to the east, completely across the highway, effectively blocking it, and it was several days before the town authorities succeeded in clearing the road.

An examination of the root masses shows the roots to have entirely disintegrated with the exception of one corner, and it really seems a wonder the tree stood as long as it did.

While there are no records showing the exact date of the building of the house near which it stood, it is said by the older people of Middletown that it was probably built about the year 1766, as it was customary at the time for a young man to provide a house upon taking a wife.

The house near which it stood was built by John Wilcox, who was born in Middletown January 15, 1740, and who married Eunice Norton October 16, 1766.

It is said in the neighborhood that when the site was being cleared and the house had been staked out someone said "don't cut down that young elm (which was growing about twenty-five or thirty feet from the prospective house), that will make a fine shade tree." So the tree was left undisturbed. In later years, when the house had passed into other hands after the death of the original owner, the tree was fenced about to protect it. It is regrettable that a photograph of the standing tree in its greatest state of perfection was not made, as a matter of record.

THE Forest Products Laboratory of the Forest Service, United States Department of Agriculture, was recently called upon to test wooden crates that would be satisfactory for carrying Army aircraft bombs. Seven types of crate were tried in the experiment and one type was evolved that would not only carry 300-pound bombs, but also 1300-pound bombs.

SONG OF THE TREE DOCTOR

Mary planted a little tree,
It flourished like a weed,
And she became quite Poplar
For her noble deed.

One day the tree began to Pine—
Kept Mary up all night,
Applying Balm of Gilead,
To save it from the blight.

And when her Dogwood bark,
She would Balsam and cry:
"Spruce up! Spruce up! Beech Cherry,
Sweet Apple of my eye!"

But the tree was Plum discouraged;
A Gum had checked its heart,
So with a rustling of the leaves
Its spirit did depart.

Then Mary drank the Hemlock—
She could not bear the blow—
And now the Pear are sleeping
Under the sad Willow.

Though this tale may be a Chestnut
There's a lesson here Fir Yew;
When you go to raising timber,
First learn just what to do.

(Reprinted.)

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Dr. Frank A. Waugh, professor of landscape engineering at the Massachusetts Agricultural College, Amherst, Massachusetts, has been appointed recreation engineer in the Forest Service, United States Department of Agriculture. Dr. Waugh, a noted author, and one of the leading landscape architects of this country, will spend the summer formulating plans for the development of public camp grounds and summer-home sites in the National Forests of Colorado, Wyoming, Utah, Idaho and other western states. This study is a part of the established plan of the Forest Service toward providing adequate camp and sanitation facilities for the 5,500,000 persons who yearly seek rest, health and enjoyment in our National Forests.

PENNSYLVANIA'S TREE PLANTERS

Water companies, owners of mining properties, and clubs of sportsmen in Pennsylvania planted more than 1,200,000 young forest trees on their holdings during the spring of 1922, according to an announcement made by Major R. Y. Stuart, the state's chief forester. During the last eight years the same groups have set out about 5,217,000 seedlings.

Last spring, the mining companies' plantings exceeded those of water companies and outing clubs by a wide margin. The former planted 840,000 young trees to provide a future timber supply for the operation of their mines. The water companies set out 320,600 and the clubs 86,470.

The largest individual planting in the spring of 1922 by a water company was made by the Pennsylvania Water and Power Company, of Holtwood, which set out 70,000 trees. Ten thousand less were planted by the Williamsport Water Company. Four other companies set out more than 25,000 each.

Of the mining corporations the Clearfield Bituminous Corporation led with 130,000. Nine other companies planted over 50,000 trees each.

CAMP FIRE PERMITS REQUIRED

Federal permits to build camp fires are now required within the National Forests of the Pacific Coast States, announces the Forest Service of the United States Department of Agriculture. These permits are free and may be secured from all forest officers and other authorized agencies. Serious forest fires and unfavorable weather conditions have caused government officials to take this step as a matter of precaution.

Five hundred men are now fighting uncontrolled fires in the Rainier, Wenatchee and Snoqualmie National Forests of Washington. The Herman Creek fire in Oregon now covers 3,000 acres and is burning close to the Columbia River highway. In spite of the efforts of 165 firefighters, the conflagration has destroyed valuable timber and a sawmill; it now threatens a Forest Service ranger station.

High winds and low humidity, say dispatches, have caused the fires to leap repeatedly into the tops of trees and jump fire-line after fire-line as if they did not exist. Fire lookouts on their mountain peak observation stations have been ineffective for many days because of the dense blanket of smoke that hides the forests. The seriousness of the situation, say forest officers, can be gauged by the fact that Governor Hart of Washington recently issued an appeal to all persons engaged in logging throughout the state to suspend operations until rain comes. He also urged tourists and others to limit all fires to those of urgent necessity, and to extinguish every smouldering ember before leaving camp.

MICHIGAN PAYS THE PIPER

Commenting on forest destruction by fire, District Forester George H. Cecil, of Portland, Oregon, cites the situation in which Michigan now finds herself. From a state whose forest wealth was considered inexhaustible she is reduced largely to a producer of fuel wood and other minor forest products—all because of indifference to fires, wasteful cutting and lack of reforestation. In other words, Michigan is now paying the piper for twenty-five years

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ruthlessness, indifference and lack of forest foresight.

The building trades and the automobile and furniture industries of Michigan must largely import their supply of high-grade lumber from other states instead of growing it at home.

For the most costly classes of woods, such as those used for automobiles, furniture and building, Michigan goes as far south as the Gulf and as far west as the Pacific; she imports all told a little more than a billion board feet of lumber and timber annually, of which 400 million come from the Gulf Coast region and nearly 180 million feet from the Pacific Northwest. For these amounts the state pays not only an enormous freight bill but also the high prices incident to constantly dwindling forests.

The reforestation of Michigan's denuded lands would after a few decades, say forest experts not merely stop these costly importations but go far toward reestablishing the state's lost leadership in her once greatest industry—lumbering—and put it upon a permanent basis.

AIRPLANE TO LOCATE ALASKA'S LOST LAKES

Locating and photographing undiscovered lakes in the National Forests of Alaska are the latest uses to which the airplane has been put, says the Forest Service, United States Department of Agriculture.

It has long been known that there are many lakes on the headlands and islands traversed by the inside passage between Seattle and Skagway that do not appear on any map. During the New York-Nome flight made by Army aviators, lakes were frequently sighted which could not be found on the latest and most authentic maps of the territory. Tales of unknown water bodies are constantly being brought in by trapper and prospectors. Less than a year ago a lake 4½ miles long and ½ mile wide was discovered at the head of Short Bay. This lake has over 1000 acres of surface area and is less than 1¼ miles from tidewater, yet because of the surrounding territory's rough topography has remained unknown and unnamed.

Recognizing that many other of these "lost lakes" may be sources of valuable water power, the Forest Service has laid plans to map this no man's land of the north by means of aerial photographs. A few days' flight, it is said, will be sufficient to cover the area with a degree of accuracy that would require many years and great expense to accomplish by ordinary methods.

The work, which has been approved by the Federal Power Commission, will be done by seaplane, flying from Ketchikan as a base.

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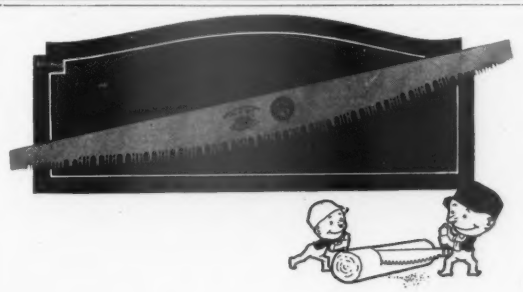

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SOUTHERN PINE STRONG AS DOUGLAS FIR

THERE is little difference between the strength of the southern pines and that of Douglas fir from the Pacific Northwest, tests made at the United States Forest Products Laboratory show. True longleaf yellow pine averages heavier, stronger, and tougher than Douglar fir. True shortleaf pine averages heavier and tougher than the fir, but is about equal to it in strength as a beam or post. Loblolly pine, though averaging heavier than the fir, is somewhat weaker. The difference in strength between any of these pines and Douglas fir, however, is not so great but that low density pieces of the one species are weaker than the average for other species.

As far as strength properties are concerned, the choice between any two lots of southern pine and Douglas fir will depend upon the grade and density of the timber composing each lot. The Rocky Mountain type of Douglas fir averages considerably weaker than the Pacific Coast type.

ONE SPARK

The weather was hot and dry. No rain for a month. The east wind moaned through the trees. Pine needles snapped underfoot. July in the forest.

The crash of falling trees. The ring of axes. The s-w-i-s-h of saws. Logs, logs, everywhere. Dry tops, branches, and slashing. And amidst all these a puffing donkey engine.

A glowing spark from the stack. A wisp of smoke. The hiss of burning pine. Crackling flames sweeping onward, skyward. A living wall of vivid fire. Black death and destruction.

ONE LITTLE SPARK—and in its wake 20,000 acres of fire-swept land; 15,000,000 feet of burned timber; four logging camps, 15 donkey engines, one locomotive, 35 flat cars, 20 houses and three automobiles in ashes, and $90,000 worth of property gone up in smoke.

It all happened this summer in the state of Washington. It could happen any summer in any forest.

ALCOHOL MADE FROM WOOD

People do not generally think of wood as a source of alcohol; that is the grain or ethyl alcohol formerly used for beverage purposes and still of use in perfumes, in manufacturing ether and as a solvent. It is quite possible, however, to make grain alcohol from wood waste through a process described by F. W. Kressman of the Forest Products Laboratory, Madison, Wisconsin.

This process is outlined in Department of Agriculture Bulletin 983, "The Manufacture of Ethyl Alcohol from Wood Waste," just issued. The making of ethyl alcohol from such things as straw, cotton, wood, and many other plant fibres is not at all new, but previously, except in very few instances, it was not possible to use these materials profitably.

There is wasted annually, Government experts estimate some 15 to 20 million tons of wood suitable for the manufacture of ethyl alcohol and capable of yielding about 15 gallons of alcohol to the ton.

THE SERIOUS FIRE MENACE

"This is the most serious forest fire season we have had for several years, and unless the public who are using the forests are more careful even more serious fires than we have had are apt to accur," said George H. Cecil, District Forester at Portland.

"We have had few if any lightning fires to date, but we are very apt to have many of these during the early part of this month. No one can prevent the lightning fires, but if people who go into the woods, for business or pleasure, would only realize the constant danger from fires spreading we would have far fewer losses of valuable timber.

"The U. S. Air Service is assisting in the patrol again. As a precautionary measure, we have been compelled to require all campers, fishermen and hikers on the National Forests of Oregon to secure camp fire permits as is being done in the National Forests of Washington.

"If only the people who go into the forests would follow a few simple rules what a saving in valuable timber and expense to the government, states and forest fire associations would result," said Mr. Cecil.

"What we call the six rules for preventing forest fires are short and simple, easy to understand and easy to follow," said Mr. Cecil. "Here they are:

(1) **MATCHES.** Be sure your match is out. Pinch it before you throw it away.

(2) **TOBACCO.** Throw pipe ashes and cigar or cigarette stumps in the dust of the road and stamp or pinch out the fire before leaving them. **Don't** throw them into brush, leaves or needles.

(3) **MAKING CAMP.** Build a small campfire. Build it in the open, not against a tree or log or near brush. Scrape away the trash from all around it.

(4) **LEAVING CAMP.** Never leave a campfire, even for a short time, without quenching it with water and then covering it with earth.

(5) **BONFIRES—Never** build bonfires in windy weather or where there is the slightest danger of their escaping from control. Don't make them larger than you need.

(6) **FIGHTING FIRES.** If you find a fire try to put it out. If you can't, get word of it to the nearest United States forest ranger or State fire warden at once."

When the great number of fires is considered, it is not surprising that statistics show that the area of forest land annually burned over is about twice that cleared by the ax for lumber and other purposes.

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CANADIAN DEPARTMENT

By ELLWOOD WILSON

The Canadian Society of Forest Engineers has suffered a great loss in the death of Mr. R. R. Bradley, Consulting Forester of Montreal. Mr. Bradley was one of the original members of the Society, and one of the best woodsmen in the province. Mr. Bradley was a graduate in law, and later took up forestry, going through Biltmore Forest School, after which he did considerable work in New Brunswick. He then became a consulting forester and did very good work during 1921 for the commission engaged in the investigation of the Department of Lands and Forests in Ontario.

The Canadian Air Board has done very valuable work during the past summer at Victoria Beach in the Lake Winnipeg district as main base, and subsidiary stations at Las Pas and Norway House. Fire detection work has been most successful, and in addition to this the Inspector of Surveys was able to visit all his parties in the district by plane in about one-third of the time ordinarily required. In British Columbia, unfortunately, the Forestry Service did not ask for help from the Air Board until the forest fires had gained considerable headway, but after taking the Deputy Minister for a flight, he became convinced of the value of the planes in fire detection and fighting. About a month ago the Air Board commenced work at the Roberval Station on Lake St. John, Quebec, for the Quebec Government, and considerable work is under way in exploration of that section.

Price Brothers & Company have been very successful with their airplane service in locating forest fires, and also in locating budworm-killed timber, and they have been engaged in taking strips of photographs usually along the water courses within their limits. The Spanish River, using a Dayton Wright two-engine plane, have at last report finished photographing 100 square miles of territory, and expected with proper weather to finish 1000 square miles by the 15th of August. The Fairchild Aerial Surveys Company (of Canada) have finished 250 square miles of aerial photography for the Laurentide Company, and have made river and power line surveys for the Shawinigan Water & Power Company. They also have a contract for 200 square miles of photography for the Ontario Government.

The airplane is more and more proving itself to be not only practical but a necessity in all kinds of woods work. Estimates of timber made directly from the photographs have turned out to be extraordinarily accurate.

Dr. Judson F. Clark has been asked by Premier Drury, of Ontario, to reorganize the forest service of that province. Dr. Clark was at one time with the Ontario Government before organizing the firm of Clark & Lyford, in Vancouver, and no better man could possibly have been chosen to take charge of this job. It is a tremendous piece of work and will mean a great deal to the Province if properly handled. The Ontario Government's publicity work by advertisements in the newspaper and reading matter furnished to various dailies and journals is a splendid step toward interesting the people of that Province in one of its most important natural resources.

Some very interesting experiments have recently been carried out in Australia in an effort to substitute Australian timbers in the manufacture of aircraft for spruce and fir from British Columbia. The majority of Australian timbers are classed as hardwoods, and one of these nearly two-thirds are of the Eucalyptus family. Although classified as hardwoods, however, these timbers vary enormously in weight and physical equalities, and timber suitable for almost any purpose is to be found among them. First of all a list of all timbers weighing less than 50 pounds per cubic foot was compiled and specimens were then examined to ascertain the nature of the break and quality of the timber; steps were then taken to ascertain which were obtainable commercially and whether they were plentiful or otherwise. This, coupled with questions of straightness of grain, uniformity of strength, etc., led to the reduction of the list to six species—Stringy Bark, Giant Gum, Sydney Blue Gum, Mountain Ash, White Ash and Long Jack. The Forestry Association of New South Wales was asked for samples of these timbers, which were not available immediately. Inquiry among timber merchants showed the indiscriminate use of the same common name for quite distinct species in the timber trade, there being at least seven distinct species sold under the name of "Mountain Ash." As some of the species included under the same trade name vary from 38 to 56 pounds per cubic foot and have moduli of elasticity of from 1,500,000 to 3,000,000, the question of selection was a real difficulty. However, these troubles were finally overcome and an order was received from the Australian Government to build six Avro 504K training machines, to be constructed from the native timbers, those to be used being Mountain Ash, White Ash, Cudgerie, Blue Fig and Queensland Maple. The three first will be used for the main structural members,

and are heavier than spruce and ash which they would replace, but their greater strength will allow some reduction in section. Queensland Maple has been used for airscrews or propellors, and several of these have been in use for a number of months with satisfactory results. The weight of the machines built with these timbers will not differ by more than 1 per cent from that of machines built from Oregon Pine, and the strength will be appreciably greater. All estimates of strength and weight were based on tests to destruction of actual components. As Australia is doing quite a good deal of flying and is continually extending its aerial mail service, the use of the native woods will be of great benefit.

Dr. W. E. Hiley, of Oxford University, has spent several months in Canada advising Price Brothers & Company in regard to fungus diseases and silviculture, and also paid a visit of inspection to the Laurentide Company. Dr. Hiley is also a specialist in silviculture methods, and his opinions in regard to conditions in Canada were very interesting, and his recommendations will be most helpful.

Sir Claude Hill, who was Director of the Indian Forest Service, and who is also a member of the Governing Council of the Empire Forestry Association, will be in Canada in October next. He is very much interested in extending the activities of the Empire Forstry Association, and will look over the forestry situation in Canada. At the last meeting of the Empire Forestry Conference held in London in 1920, it was voted to hold the next meeting in Canada in 1923. The members of the Conference in England were the guests of the British Government, and it would be necessary for the Canadian Government to act as hosts at the coming conference. However, as yet nothing definite has been announced, but it is hoped that the money will be forthcoming, as a conference meeting in this country would be of the greatest possible benefit, as the men who would attend it all stand at the top of their profession and their opinions on our local problems would be of great value. It would also help to advertise Canadian woods and help to extend their use in Empire markets.

FOREST EXPERT IN ALASKA

At the request of Secretary of Agriculture Wallace, Associate Forester E. A. Sherman of the Forest Service, left July 10 for a two months' trip through Alaska to make a field study of departmental problems. This will be Mr. Sherman's third inspection trip to the Territory.

Mr. Sherman was joined at Juneau by C. A. Flory, district forester in charge of the 20,000,000 acres of National Forests in Alaska. They go from Juneau to Valdez and travel by automobile to Fairbanks, where they will inspect the agricultural experiment station located nearby, and also the one at Matanuska. From Fairbanks they will travel over the new government railroad to Seward, and thence by steamer to Cordova, the headquarters of the Chugach National Forest. From there side trips will be made to the Prince William Sound region and to Katalla. An inspection trip will also be made from Ketchikan over the Tongass National Forest in southeastern Alaska.

Mr. Sherman will make a special study of the program of road construction in the National Forests of Alaska for which Congress has appropriated $1,000,000, the possibilities of organized forest protection for the unreserved timberlands of interior Alaska, which have suffered severely from uncontrolled fires, and the relationship of the National Forests to the general industrial development of the territory.

BARNJUM PRIZES AWARDED

Prizes have been awarded in the $1,000 Prize Essay contest on Practical Forestry offered by F. J. D. Barnjum as follows:

First prize: $500 to P. Swanson, Timmins, Ontario.

Second prize: $250 to M. Currie, Grand Mira South, Cape Breton.

Third prize: $150 to Donald C. Oxley, Annidale, Queens County, New Brunswick.

Fourth prize: $100 to R. M. Brown, Pincher Creek, Alberta.

"So many of these essays were of high order," writes Mr. Barnjum, "that the judges had a very difficult task in awarding these prizes, but inasmuch as the names and locations were detached from all essays before being submitted to the judges, the contestants have the assurance that no bias or favoritism entered into their decisions.

"All these prize essays will be published in the press from time to time so that the public may have the benefit of the suggestions and recommendations contained in these valuable contributions to the cause of forestry.

"The unsuccessful contestants can feel happy in the thought that even if they did not win a prize this time they have contributed to the welfare of their country by the valuable suggestions contained in their essays, and as our forests are our most valuable asset (for without trees civilization could not exist), they are helping to solve Canada's greatest problem.

"The success of this prize offering has been so pronounced that it is my intention to repeat this series of prizes in the immediate future and from time to time, also increasing the amount or value of the same."

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Pleasant Things Taken from Letters to the Editor

"I have enjoyed Mr. Cheney's article in the July number, 'An Epic of the Great American Forest,' very much. I feel that every American child ought to be made familiar with that story."—*R. H. H. Blome.*

"With reference to the Book Service Department, I think the Association is to be congratulated on the many ways and the broad way in which it is making itself of service to its members and to the people at large."—*Darwin B. Buell.*

"*American Forestry* is a splendid magazine and much enjoyed."—*Mrs. J. B. Sorbeer.*

"Though we had to give up many of our long list of magazines, I have no intention of giving up *American Forestry*, for it is invaluable to all citizens. As long as I am able I want to help you to keep up the good work."—*W. A. Putnam.*

"I have seen several copies of your wonderful magazine and I feel that I need its counsel in connection with my Boy Scout work here."—*Rev. John J. H. Wilcock.*

"I enjoy the magazine and I receive lots of help from it in my studies at the University."—*George L. Dally.*

American Forestry is one of the greatest publications in America."—*Prof. Highsaw.*

"Your magazine is doing a great work, we enjoy every single copy of it."—*William J. Baxley,* California.

"Your magazine is well put up and is a good ornament for the Library, besides being most instructive."—*Walter J. Selle.*

"I am very much interested in the American Forestry Association and would like the best in the world to see a forestry association formed in Argansas, as we are greatly in need of one."—*Charles M. Connor.*

"I expect to take a great deal of enjoyment in your magazine and will send you members whenever possible."—*Norman T. Bourland.*

"There are too many good things in *American Forestry* to miss a single issue."—*Clement W. Baker.*

"The March issue is absolutely a treat to me, as it contains the best thing on logging mahogany I have seen. Only one who has seen the conditions in the tropical countries can appreciate this article in its real value."—*Joseph P. Smith.*

Cannot do without *American Forestry.*"—*Elizabeth T. Owen.*

"The cover design of the magazine is so beautiful that I should like to congratulate the Editor on having found an artist who combines so much taste and skill with a keen appreciation of the characteristic features of his subject."—*Mary Woodman*

"Am well pleased with your magazine, and believe you do much good."—*William S. Kalbach.*

"I wish your charming magazine continued success and all good wishes for 1922."—*Mrs. J. F. Waggaman.*

"The magazine is unquestionably one of the most valuable published, and I want to see its work become more and more effective."—*Richard N. Johnson.*

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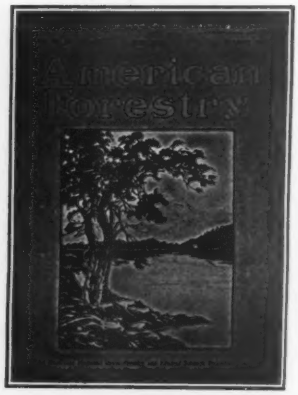

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NEW JERSEY NEWS NOTES

The resignation of Alfred Gaskill as state forester of New Jersey on July 1 has caused a reorganization of the Forestry Division of the Department of Conservation and Development. C. P. Wilber, state firewarden, succeeds Mr. Gaskill as state forester and also retains his position as head of the Forest Fire Service. W. M. Baker has been appointed Associate State Forester; William Lindsay and Leonidas Coyle become deputy state firewardens; and A. D. LaMonte, assistant forester.

The report of a strike of forest fire fighters at Woodbine, New Jersey, which was given wide publicity in the daily press was found to be entirely groundless upon investigation by the state forester. It was apparent, however, that the local firewarden had been satisfied with too small a crew and as a result, the fire developed into a serious one.

The citizens of Woodbine are now considering organizing a forest fire company to extinguish woods and brush fires. If such a company is formed it will be the first of the kind in New Jersey so far as the Fire Service knows.

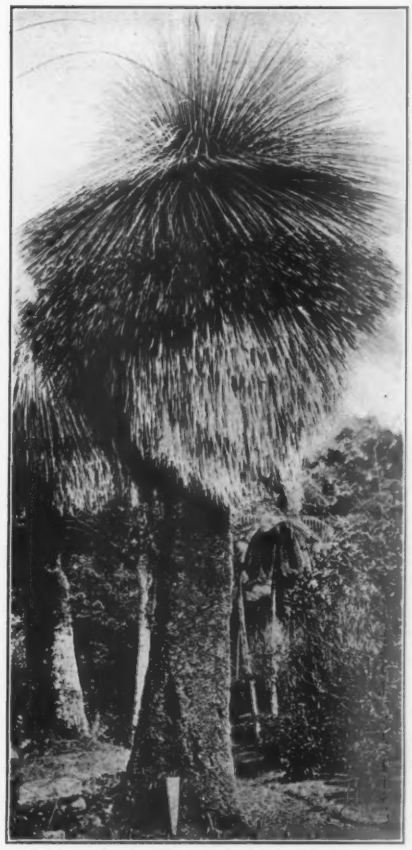
Two new lookout towers have been opened by the Forest Fire Service. One is on top of the huge naval airdome at Lakehurst, 212 feet above the ground, made possible through the cooperation of the U. S. Naval Air Service, and the other at the southern end of Kittatinny Mountain in North Jersey near Blairstown.

The spring forest fire season in New Jersey was so severe this year that the regular appropriation of $10,000 for paying citizen fire fighters has proved inadequate. An additional sum of $7,000 has been granted the Department of Conservation and Development by the State House Commission from the Emergency Fund to meet the deficit.

The department asked the legislature last year to give it an increased appropriation so that it could stop forest fires. The damage from these fires runs into many thousands of dollars and this, with the money spent for fighting them will far exceed the amount asked by the Department for the prevention or curtailing of fires.

DESTROY BLACK CURRANTS

To help combat the spread of white pine blister rust, which now menaces western forests of five needle pine valued at $228,000,000, the United States Department of Agriculture has just issued Department Circular 226, White-Pine Blister Rust in the Western United States. The circular describes the disease, its method of spread



The Gilliams Service.

THE GRASS TREE. EVER HEAR OF IT?

You'd expect this chock-headed, tinker-looking tree to be a native of Ireland and rustle in brogue to the wind, but it is one of the tropical vegetation freaks scientifically known as *Xanthorphoea Treissu Tjibodas Preauger,* but better and more descriptively known as the Grass Tree. It seems to be a cross between the palm tree and the pine, but in reality it is a member of the palm family.

American Forest Regulation

By Theodore S. Woolsey, Jr.

Limited edition, paper cover, $2.75 net, $3.00 postage prepaid (cloth, $3.50); about 230 pages (6x9 inches).

A thoroughly Americanized discussion of the regulation of forests. Introduction by B. E. Fernow, LL. D.; 4 chapters by H. H. Chapman, Professor, Yale School of Forestry.

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YOUNG MAN, 32 years old; married; graduate of Cornell University; B. S., 1914; M. F., 1915, with five years' experience in the United States Forest Service. Desires position as forester with a lumber company or private estate. The best of references. Address Box 4050, care AMERICAN FORESTRY MAGAZINE, Washington, D. C. (7-9-22)

FOREST ENGINEER, a graduate with eight years experience as chief of timberland department of large Eastern paper manufacturing company is open for position with company operating Eastern spruce lands. Address Box 4055, care AMERICAN FORESTRY MAGAZINE, Washington, D. C. (8-10-22)

GRADUATE FORESTER, at present employed by a Timber and Land Development Company, desires position as Forester or Superintendent on Private Estate, or in Park work. Experienced in Tree planting and Pruning, the handling of Shrubbery, Fire Protection and Logging operations. A willing worker as well as equipped to direct others. Box 4060, care AMERICAN FORESTRY MAGAZINE, Washington, D. C. (9-11-22)

FORESTER, with ten years' experience as technical assistant and forest supervisor, now in charge of western National Forest, desires to make connection with commercial organization with opportunity of improving present position. Address Box 4065, care AMERICAN FORESTRY MAGAZINE, Washington, D. C.

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A discussion at length of the chief facilities and methods for the movement of the timber from stump to manufacturing plant, especially logging railroads.

and tell how the people in that region can help safeguard the forests.

This pest was brought over from Europe about 20 years ago and is now established beyond hope of eradication in New England, New York and the Lake States. Lately it was discovered in western British Columbia and the Puget Sound region of Washington.

The disease attacks all white pines, i. e., those that bear their needles in bundles of five, but it can do so only after it has grown on the leaves of wild or cultivated currants or gooseberries. It cannot go directly from pine to pine. The rust can be controlled by destroying the currant and gooseberry bushes growing near white pines. The cultivated black currant is the most dangerous because it takes the disease more severely than the others and spreads it more rapidly. Its immediate destruction is the most effective means of preventing the blister rust from gaining a foothold in the western pine forests.

Federal quarantines have been established supplementing state quarantines, to prevent the introduction and spread of the blister rust in uninfected regions. They prohibit the movement of five-needle pine, currant and gooseberry plants into the United States from any foreign country, including Canada; prohibit their movement from all states east of and including Minnesota, Iowa, Missouri, Arkansas and Louisiana, to points outside the quarantined area; and prohibit their movement out of that part of Washington west of the summit of the Cascade Mountains.

The colored illustrations in the circular show the natural appearance of the disease. Persons who live in five-needle pine regions are urged to get the circular from the Department of Agriculture, Washington, D. C., and become familiar with the principal characteristics of the blister rust. Everyone can materially aid in the fight against this disease by examining the under side of the leaves of all currants and gooseberries in gardens, especially cultivated black currants and any native or planted white pines in your community. If the plants appear to be diseased in a manner similar to the colored illustrations in the circular, send the diseased material to the State Nursery Inspector or the Agricultural Experiment Station in your state, together with your name and address and particulars as to the location of the plants.

Each person has some responsibility in protecting the extensive forest resources of the west which contain about three-fourths of the white pine in the country, approximately 57 billion board feet. Nearly 25 per cent of the western white pine stumpage and 40 per cent of the sugar pine stumpage belongs to the Federal government. These pines are the most valuable forest trees in the west.

NELSON BROWN DECORATED

Word has been received at the New York State College of Forestry that Nelson C. Brown, head of the Utilization Department has been decorated by the King of Italy for his services in connection with forestry work during the war.

Professor Brown left the college faculty in 1917 to investigate the effects of the war upon the lumber trade in Europe for the Department of Commerce. After a tour of all the principal lumber producing sections of the United States and Canada he spent approximately two years in Europe along the fighting fronts. He investigated forestry practice and the lumber industry in Great Britain, France, Belgium, Spain, Italy, Greece, Serbia and portions of northern Africa, and later Poland, Russia, Austria and Hungary. He also purchased lumber, railroad ties and other supplies in Spain for the United States army.

He then engaged in the domestic and foreign lumber trade for the American Woods Export Association. He has also been closely affiliated with the American Lumber Sales Company which took over the contract for the disposal of 135,000,000 feet of the surplus stock of the United States Shipping Board.

Professor Brown spent the winter of 1920 as consulting adviser to the Republic of Czecho Slovakia on the management and exploitation of the Hapsburg crown forests and returned as head of the Utilization department on the Forestry faculty last year. Professor Brown was graduated from the Yale Forest School in 1908. He is a director of the American Forestry Association.

FORESTRY AT PENNSYLVANIA STATE COLLEGE

A large number of courses in forestry and lumbering will be given at the Pennsylvania State College during the coming school year, according to an announcement made recently at that institution. Under the Department of Forestry in the School of Agriculture, special courses will be given in silviculture, the care and protection of forests, making of timber to secure reproduction and to improve the growth and condition of the forest, logging and milling, forest law, forest economics and history, forest surveying, mensuration, seeding and planting, wood technology, administration, forest products, uses of lumber, marketing, tree identification and seasoning of wood.

During the last quarter of the senior year the lumber class will camp on a large timber tract in the South for the purpose of making plans. The freshman class will also attend a summer camp in The State Forest Preserves.

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